Economics Education and Research Consortium
Working Paper Series

Endogenous Tariff Protection and the Level of Trade Distortions in Russia

Sergey Afontsev

Working Paper No 01/07

This project (No 99-271) was supported
by the Economics Education and Research Consortium

Research area: **Public Economics**

JEL Classification: F13, F14, P26, P33

AFONTSEV S.A. Endogenous Tariff Protection and the Level of Trade Distortions in Russia. — Moscow: EERC, 2002. — pp 1–51.

This paper addresses the political economy background of import protection policy in Russia under the system of policy-making institutions developed during the period 1992–1997. Models explaining import penetration levels and import tariff rates are constructed and estimated independently as well as in a simultaneous setting. Import penetration measures, instrumented by factor intensity variables and an economies-of-scale variable, appear to exercise a highly significant positive impact on the level of tariff rates. At the same time, no statistically significant negative influence of tariff rates on the level of import penetration was found, meaning that producers' losses due to the trade liberalization can be less than usually expected.

Keywords: Russia, political economy, endogenous protection theory, tariff regulation, policy formation in transition economy, trade policy in Russia.

Acknowledgements. I am very grateful to Isabelle Brocas, Juan Carrillo, Leonid Polishchuk, Yingyi Qian, and Judith Thornton for their helpful suggestions. Special thanks to Erkki Koskela for his discussions of the econometric issues and advice on the literature, and to James Leitzel for detailed comments on the text.

Sergey Afontsev
Institute for World Economy and International Relations,
Department of Market Economy Evolution
23 Profsoyuznaya ul., 117997 Moscow, Russia
Tel. +7 (095) 128 17 74
Fax: +7 (095) 120 65 75
E-mail: afontsev@cityline.ru

CONTENTS

NON-TECHNICAL SUMMARY

Ten years of economic transition in post-socialist countries proved that institutional aspects of economic policy formation are at least as important for the success of reforms as their purely "economic" aspects. The importance of political economy factors in trade reforms is widely recognized in the theoretical literature. One can identify two important dimensions of the trade liberalization problem that should be addressed in the political economy setting.

First, to predict the pace of liberalization, one should know what are the exact political economy mechanisms governing trade policy formation in a given system of policy making institutions. Second, to analyze the impact of trade liberalization on the national economy, it is necessary to assess the level of distortions associated with "pre-reform" trade policies.

Though these two dimensions of the problem are obviously related to each other, in most cases they are addressed independently. Studies of the impact of trade liberalization on trade flows and aggregate welfare have been flourishing in recent decades, but even the most sophisticated studies do not usually take into account the role of political economy mechanisms underlying trade policy formation. Meanwhile, recent studies showed that endogenizing trade policy variables can significantly change the estimates of the impact of trade barriers on the volume of trade.

In turn, most empirical studies on endogenous trade protection assume that import penetration is an important explanatory variable for the existing level of trade barriers, while the relationship in the opposite direction, though sometimes recognized, is not explicitly taken into account. Such an approach seems to be quite justified when the time period under consideration is short enough so that a newly established protection level does not influence import penetration; for longer time periods, however, results may be seriously biased. As a consequence, simultaneous estimation of models describing the political economy mechanism of trade policy formation *and* the impact of import barriers on trade flows can provide us with a better understanding of both the roots and fruits of import protection.

This paper addresses the political economy background of import protection policy in Russia under the system of policy making institutions developed during the period 1992 – 1997. It approaches to

- identify the set of political economy factors affecting government decisions on the structure of import tariff rates,
- estimate the impact of tariffs on Russian trade when their political economy determinants are explicitly taken into account, and
- provide insights into possible ways of further trade liberalization given the existing system of policy making institutions.

To reach these goals, a theoretical framework for analyzing the structure of both import flows and tariff rates is elaborated. This framework is then used to construct, for the purpose of the empirical investigation, the Endogenous Protection models and the Import Penetration models. The Endogenous Protection models are designed to test assumptions about the impact of pressure groups on tariff policy as well as the desire of government officials to use import tariffs to support stagnant industries and mobilize additional budget revenues. It turn, the Import Penetration models addresses the impact of factor intensity variables and economies of scale (as proxied by quality differences between domestic and imported goods) on alternative measures of the market share of imports.

The Import Penetration models and the Endogenous Protection models are estimated both independently and in a simultaneous setting. The most important findings can be summarized as follows:

- *The level of import penetration* seems *to be unaffected by tariff rates*. No statistically significant negative influence of tariff rates (whether actual or predicted from the Endogenous Protection models) on the level of import penetration were discovered. This "neutrality" of tariff rates does not mean, however, that the effects of protection are entirely harmless, as import tariffs in any case exercise upward pressure on domestic prices and thus redistribute income from consumers to producers.
- There are convincing signs of a counterintuitive relationship between the factor cost shares and the measures of import penetration. The finding that Russian imports appear to be labor intensive rather than capital intensive contradicts the stylized beliefs about the structure of comparative advantages in Russian foreign trade. Thus, further study is needed to identify the determinants of the Russian import structure in line with the recent efforts to explain the apparent contradictions between trade patterns in the real world and the predictions of the Hecksher-Ohlin-Vanek theorem.
- *Import penetration determined by factor intensity variables appears to be the most important determinant of tariff rates.* In contrast with the more traditional endogenous protection models that use actual values

of import penetration, models with the predicted import penetration variables allow one to explain a substantially higher share of variation in tariff rates. The impact of the predicted import penetration variables is highly stable with respect to the set of industry observations as well as other variables in the Endogenous Protection model. We can thus conclude that the institutional system of tariff policy formation in Russia favors the protection of industries whose low competitiveness in foreign trade is caused by the comparative advantage factors.

- *No single hypothesis could be interpreted as an unambiguous explanation of the tariff formation process*. There is evidence pointing to (1) the influence of pressure groups on the policy decisions, and the desire of policy makers to (2) provide at least moderate support for stagnant industries as well as (3) maximize tariff revenues.

These results can form the basis for assessing the prospects of further import liberalization in lines with the WTO rules. Given the finding about the "neutrality" of tariff rates, their reduction will hardly affect import penetration substantially. As a consequence, pressure group opposition against lowering tariff rates is unlikely to be harsh.

The "neutrality" of tariff rates also suggests that the decrease in government revenues due to lower tariff rates will not be compensated for, as import volumes will not rise substantially. Adequate compensation for the revenues lost can be achieved by closing channels for "grey" imports. These measures will not only generate additional revenues for the budget but also raise the support of import-competing producers who would be more eager to accept the "bundle" of government policies which supposes lower tariffs *but* higher barriers for illegal imports.

Finally, there is a need for reconsidering the role of tariffs in protecting stagnant industries. Given the large variance in enterprise performance, tariffs are quite imprecise instruments of industrial policy as they "protect" enterprises irrespective of their ability to adjust to the prevalent degree of import competition. Microeconomic policies of industrial restructuring seem to be more appropriate than tariffs for raising the degree of competitiveness, at the same time allowing the government to generate additional tax revenues due to the rise in enterprise efficiency.

1. INTRODUCTION

Trade policy reforms in transition economies during the 1980s and 1990s brought about some puzzling results that went contrary to widely held expectations. On the one hand, many countries were able to pursue liberal trade policies despite the alleged influence of powerful pressure groups interested in import protection. On the other hand, in some countries radical dismantling of trade barriers resulted in only marginal changes in resource allocation and overall economic efficiency. These puzzles have attracted considerable attention of trade analysts (see, *e.g.*, Harrison and Hanson (1999) and the literature cited thereof) and induced them to appeal to the political economy approach to trade regulation for possible explanations (for an overview of this approach, see Mayer, 1984; Magee *et al.*, 1989; Rodrik, 1995).

The importance of political economy factors in trade reforms is widely recognized in the theoretical literature (see, *e.g.*, Rodrik, 1989; Hillman and Ursprung, 1996; Wunner, 1998). We can identify two important dimensions of the trade liberalization problem that should be addressed in the political economy setting.

First, to predict the pace of liberalization one should know what are the exact political economy mechanisms governing trade policy formation in a given system of policy making institutions. For this purpose, one needs to answer the following questions: How does the government react to pressures exercised by protectionist lobbies? What weight does it assign to the welfare of ordinary citizens or distinct social groups? Does it pursue some "autonomous" motives in trade policy (*i.e.*, motives not related to the strategy of maximizing political support)?

Second, to analyze the impact of trade liberalization on the national economy, it is necessary to assess the level of distortions associated with "pre-reform" trade policies. Reduction in trade barriers may (or may not) lead to intensive shifts in the degree of import penetration in different industries depending on the historical structure of trade protection (Harrison and Hanson, 1999).

Though these two dimensions of the problem are obviously related to each other, in most cases they are addressed independently. Studies on the impact of trade liberalization on export-import flows and aggregate welfare have been flourishing in recent decades, but even the most sophisticated of these studies usually do not take into account the role of

political economy mechanisms underlying trade policy formation (see, *e.g.*, the prominent studies of the Uruguay Round results such as those by Francois *et al.*, 1995; Hertel *et al.*, 1995; Harrison *et al.*, 1997). Meanwhile, endogenizing trade policy variables can significantly change the estimates of the impact of trade barriers on the volume of trade. For example, empirical analysis shows that the impact of non-tariff import barriers in the model with endogenous protection is some 10 times as high as it is in the models that treat protection levels as an exogenous variable (Trefler, 1993).

In turn, most empirical studies on endogenous trade protection assume that import penetration is an important explanatory variable for the existing level of trade barriers, while the relationship in the opposite direction, though sometimes recognized, is not explicitly taken into account (for one of the recent examples, see Olarreaga and Soloaga, 1998). Such an approach seems to be quite justified when the time period under consideration is short enough so that a newly established protection level does not influence import penetration; for longer time periods, however, results may be seriously biased.

As can be seen from what has been said above, simultaneous estimation of models describing political economy mechanisms of trade policy formation *and* the impact of import barriers on trade flows can enable us to receive more realistic answers to two major questions:

- What are the particular political economy forces governing the evolution of trade policy in a transition economy given the existing system of policy-making institutions? In other words, what are the political economy roots of import protection?

- What is the "true" impact of trade barriers on import flows, given that the endogenous character of trade policy is fully recognized? That is, are the fruits of import protection as dangerous for the economy as is usually suggested?

This paper addresses these questions through the econometric analysis of data related to the Russian experience with trade policy reform. The material is organized as follows. In Section 2, the nature of the problem under consideration is explained. Section 3 contains the description of the theoretical basis on which the empirical models in Section 4 are constructed. The results of testing these models are presented in Section 5. Finally, in Section 6, the major findings of the study and its principal policy implications are summarized.

2. THE PROBLEM OF THE STUDY

The purpose of the paper is to explain the political economy background of the import protection policy in Russia and to assess its impact on import flows. These questions are approached by comparing the results of testing models that treat endogenous tariff policy formation and the impact of tariff rates on import flows as independent processes and models that treat these processes as simultaneous ones.

The analysis of endogenous tariff protection rests principally on the results of our previous work.[1] In that study, political economy mechanisms governing tariff formation were examined in a year-by-year setting (for the period 1993 – 1997) for the commodity types classified by the official statistics as "the main commodities of Russian foreign trade". This mechanism can be described by the "stagnant industries – tariff revenues" hypothesis that stresses the government's desire to support industries suffering from an adverse economic situation as well as to raise additional revenues for the budget.[2]

In the previous study, import penetration levels in each individual year were assumed to influence the tariff formation process during the year under consideration, being independent of the impact of tariff rates established by this process. Though such an assumption is quite reasonable during a period of frequent and profound tariff changes, it is of course not realistic as far as the period as a whole is concerned. To address the problem of endogenous tariff formation in a more general way, we should take into account the *two-directional* interaction between tariff rates and the degree of import penetration.

The simultaneous models for analyzing this interaction are constructed using the theoretical framework proposed by Trefler (1993). Our distinctions from Trefler's model are the following: (1) trade policy variables in the focus of this paper are tariff rates, not non-tariff barriers; (2) we are interested not only in assessing the impact of trade barriers on import flows, but also in identifying the particular political economy forces behind these barriers; (3) Trefler analyzed the impact of trade barriers on import flows in a comparative advantage setting; in addition, we take into account economies of scale, a factor stressed by the New Trade Theory (*e.g.*, Fujita, Krugman and Venables, 1999).

---

[1] See Afontsev (2000). The earlier version of this article was presented at the first annual Global Development Network conference in Bonn, December 6 – 8, 1999.

[2] Some of our results — *e.g.*, those related to the impact of the import penetration variable as well as the share of industrial sectors in total employment — also gain support from the model for 1993 presented by Neven *et al*. (1998).

In this empirical study, the attention is focused on the year 1997 for the following reasons: (1) the process of tariff structure formation, which was launched in 1992 from the level of zero tariff protection, was generally completed by this year; (2) the structure of the comparative advantage that was reported to change intensively during the first years of economic transformation in post-communist countries (Neven, 1994) had probably more or less stabilized; (3) the crisis of 1998 produced short-term disturbances that made foreign trade data for the later period less appropriate for the analysis of longer term phenomena of tariff policy formation.

To explore the problems of interest, three types of models described in Section 4 are estimated. Before this, however, it is necessary to clarify the theoretical background for constructing empirically verifiable hypotheses.

3. THEORETICAL FOUNDATIONS OF THE EMPIRICAL STUDY

This section presents a general structure of economic models based on the endogenous protection theory to reflect the logic of the tariff formation process. The material is organized as follows. The point of departure is the behavior of firms engaged in lobbying for higher tariff rates. Then follows the analysis of the utility function maximized by the government with some implications for the empirical exercise. Finally, attention is given to the determinants of the import penetration levels that play a prominent part in the analysis.

3.1. Lobbying

Each firm i in an industry producing a tradable good g maximizes its benefit function

$$B_i = S_i(t) - c_i, \tag{1.1}$$

where $S_i(t)$ is a supplier surplus function for firm i, t is the tariff rate (tariffs being the only policy instruments used by the government), and c_i is the sum of money used for lobbying. We assume here that these lobbying expenditures take the form of a welfare transfer (in terms of campaign contributions, bribes, *etc*.) from the lobbying firm to the government that formulates tariff policy. An individual firm thus maximizes B_i by choosing c_i such that the marginal benefits from the increased protection will equal the marginal costs of extra lobbying.

Let $S_i(t) = u_i S(t)$, where $S(t)$ is a supplier surplus for an industry as a whole and u_i is the share of firm i's sales in total sales of an industry. The total sum of lobbying expenditures of all firms in an industry (C) is an important factor (though, as can be seen in the next section, not the only factor) affecting the level of tariff rate t, with $dt/dC \geq 0$. The first order condition for maximization of the benefit function is given by

$$dB_i/dc_i = u_i(dS/dt)(dt/dC)(dC/dc_i) - 1 = 0, \tag{1.2}$$

where $dS/dt \geq 0$, $dt/dC \geq 0$, $dC/dc_i \geq 0$.

Consider the behavior of dC/dc_i. Using the standard assumption that tariff protection represents a public good for members of the pressure group, we have the following form of the total lobbying expenditure function:

$$C = C' + c_i, \qquad \text{where } C' = \Sigma_{j,\, j \neq i}\, c_j. \tag{1.3}$$

An increase in c_i raises C directly, while at the same time it generates the stimuli to free ride for other firms in the industry, *i.e.*, to decrease their own lobbying contributions:

$$dC'/dc_i \leq 0.$$

As a consequence, we have

$$0 \leq dC/dc_i \leq 1,$$

with

$$dC/dc_i = 1$$

if there is only one firm in the industry and

$$dC/dc_i \to 0$$

if the number of firms in the industry (n) approaches infinity.[3] Thus, we can state that

$$dC/dc_i = \vartheta(n),\ 0 \leq \vartheta(n) \leq 1,\ d\vartheta(n)/dn < 0. \tag{1.4}$$

Let us turn now to the behavior of dS/dt. The absolute supplier surplus gain from a given rise in t is higher the higher the volume of sales V and the higher the responsiveness of the domestic supply function to the rise

[3] The proposition that a higher number of firms is associated with a lower value of dC/dc_i corresponds to the classical assumption by Olson (1965) that the degree of the free rider problem is positively associated with the number of lobby members.

in a commodity price (p) caused by the rise in tariffs, since the increase in the volume of national production Q allows national firms to capture some share of the domestic market formerly supplied by imports. As $dQ/dp > 0$, $d^2Q/dp^2 < 0$ (given the decreasing returns on the industry level) and $dD/dp < 0$ (where $D = Q+M$ is the level of domestic demand for good g, whereas M is the volume of imports), then for given demand and supply curves, higher values of dQ/dp are associated with a higher import penetration ratio defined as $m = M/Q$. Thus, we can write $dQ/dp = Y(m)$, $dY(m)/dm > 0$ so as the expression for the supplier surplus gain would be

$$dS/dt = \Theta(V, Y(m)).^4 \tag{1.5}$$

Given the standard assumption of decreasing returns to lobbying ($d^2B_i/dc_i^2 < 0$), every factor raising dB_i/dc_i for each c_i raises the equilibrium level of a firm's expenditures for lobbying c_i^e. Let

$$\Psi_i(V, n, m, u_i) = c_i^e, \; c_i^e \geq 0. \tag{1.6}$$

From arguments stated above, we have the following properties of Ψ_i:

$$\rightarrow \partial\Psi_i/\partial n < 0 \text{ from (1.4)}; \tag{1.7}$$

$$\rightarrow \partial\Psi_i/\partial V > 0, \; \partial\Psi_i/\partial m > 0 \text{ from (1.5)}; \tag{1.8}$$

$$\rightarrow \partial\Psi_i/\partial u_i > 0 \text{ directly from (1.2)}. \tag{1.9}$$

Assume also $\partial^2\Psi_i/\partial u_i^2 > 0$; that is, for low levels of u_i a given increase in the market share leads to a small increase in dB_i/dc_i due to the dissipation of benefits from an increase in tariff rate t to other firms in the industry. On the contrary, firms controlling large market shares can expect to capture most of the benefits generated by their lobbying activity.

The equilibrium level of total lobbying expenditures in industry C^e is defined by the function

$$\Psi = \Sigma_i\Psi_i(V, n, m, u_i). \tag{1.10}$$

---

[4] Note that for the increasing-returns-to-scale industries, we can just write $dS/dt = \Theta(V)$, as for the given shapes of the demand and supply curves a higher volume of sales also means greater responsiveness of the production volume to price increases (dQ/dp).

Then,

$$\rightarrow \partial\Psi/\partial n < 0,\ \partial\Psi/\partial V > 0,\ \partial\Psi/\partial m > 0, \tag{1.11}$$

since (1.7) and (1.8) hold for each Ψ_i;

$\rightarrow$ for given V, m, n, and $u_k = u_{k+1}$, $\partial^2\Psi_i/\partial u_i^2 > 0$ implies

$$\Sigma_{i,\ i\neq k,\ k+1}\Psi_i(V, n, m, u_i) + \Psi_k(V, n, m, u_k) + \Psi_{k+1}(V, n, m, u_{k+1}) <$$
$$< \Sigma_{i,\ i\neq k,\ k+1}\Psi_i(V, n, m, u_i) + \Psi_k(V, n, m, u_k + d) +$$
$$+ \Psi_{k+1}(V, n, m, u_{k+1} - d). \tag{1.12}$$

It follows from (1.12) that having two industries that are otherwise similar, we could expect that the more highly concentrated one would be able to generate a higher transfer of resources for the government.

Arguments presented in this section form the basis of the pressure group hypothesis that is usually appealed to as the major explanation of the tariff formation process. Now we should analyze the behavior of the government that reacts to lobbying contributions and also takes into account some additional considerations.

3.2. The Government

To approximate the Russian situation more precisely, we concentrate our attention here on the behavior of the government as the only supplier of trade policies and follow the general logic of the political contributions approach to trade policy formation.[5]

The government sets tariff rates for each tradable good g so as to choose internal price vector $P = P(p_1, p_2, ..., p_h)$ that maximizes the political support function

$$G = a\Sigma_g C_g(t_g) + W(P), \tag{2.1}$$

where $C_g(t_g)$ is the amount of lobbying expenditures from an industry g that can be collected if t_g is enacted, $W(P)$ is the total welfare of the

[5] For the typology of approaches to endogenous protection modeling, see Rodrik (1995). The classical example of the approach under consideration is of course *Protection for Sale* by G. Grossman and E. Helpman (1994). The recent paper is not designed to test the implications of the Grossman – Helpman model (for two of the most recent tests, see Gawande and Bandyopadhyay, 2000; Goldberg and Maggi, 1999). Rather, the general framework of the political contributions approach is used to construct a set of analytical cases (in some sense, "ideal types" of tariff policy formation) to put forward empirically testable propositions.

country's citizens that stays in this formula for the interest of the voters, and $a > 0$ is the relative weight attached by the government to lobbying contributions as compared with aggregate welfare.[6] Note that $C_g(t_g)$ in our formulation is independent of internal price vector P if all g's are final goods since the number of people responsible for making decisions on the level of lobbying expenditures is too small as compared with the total population, and they consume only a negligible proportion of the total amount of each good g; thus, they care only about the price of the good that is produced by their respective industries.

The aggregate welfare function is the aggregate of individual welfare functions $W_j(P)$ that in turn depend on the level of money income, $I_j(P)$; government transfers, r_j; and consumer surplus, $w_j(P)$:

$$W(P) = \Sigma_j W_j(P) = \Sigma_j (I_j(P) + r_j + w_j(P)). \quad (2.2)$$

The total amount of government transfers depends on the total level of tariff revenues $R(P)$ that is assumed here to be the only source of money available for redistribution, while the "ordinary" expenditures are financed out of non-tariff revenues:

$$\Sigma_j r_j = R(P) = \Sigma_g \Delta p_g (D_g - Q_g), \quad (2.3)$$

where Δp_g is the price increase for good g due to tariff t_g, while D_g and Q_g are levels of domestic demand for and domestic supply of this good. We assume that in the general case, government transfers r_j do not depend on lobbying contributions studied thus far. Indeed, efforts of different groups to obtain a larger share of these revenues could be described as a game at the second level of rent seeking (Buchanan, 1980), which is not the subject of our concern here.

The logic presented here allows us to explore different types of government behavior.

Case 1. Assume first that the government is entirely captured by pressure groups so that it does not care about the welfare of "ordinary" citizens (this description suits both the situation of a "weak government" as usually understood and the situation of a strong dictatorship serving the interests of definite economic groups). Then, decisions to impose higher tariff rates depend on (1) the intensity of lobbying by those pressure groups that are able to overcome the free-rider problem, and (2) the ability to collect tariff revenues to be distributed among these groups.

[6] It is quite reasonable to assume that a is the same for all industries; *i.e.*, the government does not differentiate between contributions received from various pressure groups.

Case 2. In Section 3.1, we assumed that the only trade policy variable which firms in each industry try to influence is the tariff rate for a good *g* produced by this industry. If some *g*'s are intermediate goods, it is possible that some industries will lobby not only *for* a tariff on their own good but also *against* tariffs on goods used in their production process. In this case, due to counter lobbying, tariffs for intermediate goods will be as a rule lower than those for final goods; this is indeed a common political economy explanation of the tariff escalation phenomenon.

Case 3. Assume now that the government maximizes the "conservative social welfare function" as suggested by Corden (1974): it alleviates losses of producers operating in industries with high and/or rising import penetration (or suffering from output decline induced by foreign competition) by levying tariffs on their goods. At the same time, it compensates the welfare losses of those hurt by tariffs through transfers out of tariff revenues, and assigns zero weight to lobbying contributions ($a = 0$ in (2.1)).[7] The more workers employed in an industry, the more evident becomes the "conservative social welfare" reason to support them with tariffs. This also implies that higher tariffs could be applied to goods produced by just those industries that in Cases 1 and 2 would be unable to overcome the free rider problem due to the large number of enterprises. The logic is straightforward, as industries with a large number of enterprises tend to be geographically dispersed and employ more voters.[8]

Case 4. Finally, consider the revenue-constrained government whose non-tariff revenues are insufficient to finance its "ordinary" expenditures. In this case, the government is forced to maximize tariff reve-

[7] This implies zero efficiency of lobbying and thus the absence of pressure group activity. Note that as there is no lobbying in this case, the government should take into account the *observed* import penetration, whereas in the lobbying cases, the government reacts to the degree of import penetration *as revealed* by the pressure groups' demands (*e.g.*, when pressure groups confront the government with their contribution schedules as assumed by Grossman and Helpman, 1994). This fact presents a sort of problem for empirical research: indeed, import penetration variables *known* to pressure groups, on the one hand, and the government, on the other, could differ substantially. This problem will be discussed in more detail in Section 4.1.

[8] The maximization of the conservative social welfare function does not necessarily assume benevolent government behavior. The principal attention given to the voters' welfare could be accounted for by the desire of the incumbent government to raise electoral support when the (positive) elasticity of votes on the level of lobbying contributions is low. In this respect, arguments presented in the text are equivalent to the "adding machine hypothesis" suggested by Caves (1976).

nues — $\Sigma_g \Delta p_g (D_g - Q_g)$ — while at the same time it tries to minimize distortions introduced by tariffs to the aggregate welfare function where transfers r_j go down to zero due to the absence of "free funds".

The four cases described above represent analytical "ideal types" that can hardly be found in the real world in their pure form. However, it is useful to formulate explicitly the key factors explaining the tariff structure in these "ideal" cases to see what are the major novelties introduced by taking into account the behavior of the government (Table 1). As can be seen, the set of factors that could affect the level of tariff rates is quite large. In Section 4, the information on these factors is used to formulate empirically testable propositions about the determinants of the Russian tariff structure.

Table 1. Key Factors Explaining the Tariff Structure when the Government's Behavior is Explicitly Modeled

Case	Description	Key explanatory factors
Case 1	"Captured" government	Lobbying contributions to raise tariffs; tariff revenues
Case 2	Lobbying with intermediate goods	Lobbying contributions to raise/reduce tariffs (tariff escalation pattern)
Case 3	"Conservative social welfare function"	Degree of import competition *observed* by the government; number of employees
Case 4	Revenue-constrained government	Tariff revenues

3.3. The Import Penetration Levels

As we have seen, the share of the national market supplied by imports can be an important factor influencing both the desire of firms in an industry to lobby for higher import tariffs and the government's policy priorities. But what factors affect the level of import penetration itself? The natural way to analyze the determinants of import penetration is to assume that for a given level of domestic demand for a good *g,* the demand function for imports of this good takes the following form:

$$M_g = M_g(p_g^H / p_g^F, \tau_g), \tag{3.1}$$

where p_g^H / p_g^F is the ratio of producer's unit prices at home and abroad, and τ_g denotes the trade costs function that makes the domestic price of imported goods higher than the producer's unit price abroad (this function takes into account import tariffs, transportation costs, security of property rights on imported goods, *etc*.). In studying Russian foreign trade where inter-industry trade flows prevail, it seems appropriate to assume that the ratio of the producer's unit prices is determined predominantly by forces described by the traditional Hecksher-Ohlin theory. Once again, the simplest way to explain the ratio of producer's unit prices would be to take into account factor intensities of production of a good *g* in Russia and abroad. Assume there are only two productive factors, capital *K* and labor *L*. Then, if α_g^K and α_g^L are factor intensities while K^H/K^F and L^H/L^F are the relative endowments of a country with these factors as compared with the "outside world", one can write

$$p_g^H / p_g^F = \Phi(\alpha_g^K, \alpha_g^L, K^H/K^F, L^H/L^F). \quad (3.2)$$

This formulation, however, assumes that the production technology at home and abroad is exactly the same. If home-produced and imported goods are of different quality as is common in intra-industry trade (Greenaway and Torstensson, 1998), this assumption seems to be not very realistic. Due to this fact, expression (3.2) could be re-written as

$$p_g^H / p_g^F = \Phi(\alpha_g^{HK}, \alpha_g^{HL}, K^H/K^F, L^H/L^F, q), \quad (3.2')$$

where α_g^{HK} и α_g^{HL} are factor intensities of production at home and *q* is a quality index measuring the degree of quality difference between home-produced and imported varieties of a given good. The quality index is used here to reflect technological differences of production at home and abroad. We prefer not to make any *a priori* assumptions about the relationship between the degree of quality differences and factor intensities of production (arguments in favor of these assumptions can be found, for example, in Favley, 1981 and Greenaway and Milner, 1986). Instead, the quality index can be reasonably interpreted as a proxy for economies of scale. There could be two justifications for this interpretation, the first related to the fixed costs of product development (which are in most cases higher for the higher-quality varieties of a given good) and the second related to the imperfect substitutability between higher quality varieties, which influences the ratio of average to marginal costs under monopolistic competition (Greenaway and Torstensson, 1998, p. 3). However, there is no reason to make special assumptions on the nature of the market competition for goods imported to Russia, and

thus only the first factor is of interest here: the higher the quality of a given product variety, the higher the fixed costs of product development, so the scale of operation (and thus the ability to "distribute" these costs among a larger number of items produced) becomes an important factor in price competitiveness.

Using quality differences as an indicator of economies-of-scale differences between Russia and the "outside world" and relying on the message of the New Trade Theory that greater exploitation of scale economies is an important factor of trade specialization and gains from trade,[9] we could assume that the degree of scale advantages/disadvantages in specific product lines (*i.e.*, the degree to which expanding output could allow Russian producers to increase their competitiveness relative to foreign producers) can serve as a determinant of the Russian trade structure in addition to the more traditional factor proportion variables.

Arguments presented in this section allow us to proceed with the formulation of hypotheses to be tested in the empirical part of this study.

4. ECONOMETRIC MODELS

4.1. The Endogenous Protection Model

The Endogenous Protection model is intended to reflect the impact of political economy variables on government policies with respect to individual industries:

$$Rate = b_1 + b_2 ShImp_{ij} + b_3 \Delta Out + b_4 NEnt + b_5 Sh4 + \\ + b_6 AvSales + b_7 ShImpI + b_8 ShEmp + b_9 Loss + b_{10} DInt + \varepsilon_1, \quad (4.1)$$

where

Rate is the nominal rate of *ad valorem* tariffs or *ad valorem* components of compound tariffs, 1997;

$ShImp_{ij}$ is the measure of import penetration, 1997 (see below);

ΔOut is the rate of change in physical volume of output during the period 1990 – 1997 (output decline in 1990 – 1997, per cent);

[9] For the basic models, see Krugman (1979, 1980). A detailed survey of the arguments on the role of scale economies in perfect, monopolistic and oligopolistic competition settings can be found in Bhagwati *et al*. (1998), chapters 11 and 30. For a broader theoretical discussion, see Krugman (1995).

NEnt is the number of enterprises in an industry, 1997 (we use detailed data for some 65 industries);

*Sh*4 is the market share of the four largest firms (for 27 broad industrial groups);

AvSales is the average value of output per enterprise, 1997 (calculated according to the formula *AvSales* = *VQ*/*NEnt*, where *VQ* is the value of national output of a commodity);

$ShImpl_j$ is the share of imports of a given commodity in Russian imports from non-CIS countries ($j = 1$) or in the total volume of Russian imports ($j = 2$), 1997 (in per cent);

ShEmp is the share of employment in an industry in the total employment in manufacturing, 1997 (in per cent, for 27 industrial groups);

Loss is the share of loss-making enterprises in an industry (in per cent, for 27 industrial groups), 1997;

DInt is the dummy variable taking the value of 1 for intermediate goods and the value of 0 for consumer goods.

The choice of the independent variables is closely related to the arguments presented in the previous section. Import penetration and output variables characterizing the market situation for individual commodity types ($ShImp_{ij}$ and ΔOut) could serve as important explanatory variables for tariff rates according to the logic of the pressure group hypothesis and "the conservative social welfare" motive of the government.[10] The variables *NEnt*, *Sh*4, *AvSales*, and *DInt* are intended to reflect the logic of the pressure group hypothesis.[11] The higher the number of enterprises (*NEnt*), the more acute the free-rider problem in a pressure group and the less effective the lobbying; on the contrary, higher industry concentration (measured by the market share of the four largest firms, *Sh*4) is associated with higher lobbying contributions. In turn, the

[10] As far as the pressure group hypothesis is concerned, output decline — even independent of the dynamics of imports — reduces opportunity costs of lobbying and thus could increase stimuli for pressure group activity. This applies, of course, to "moderate" rates of output decline only, since in case of severe and protracted output shock, firms could be deprived of resources necessary for lobbying.

[11] While a tariff is a kind of public good for the enterprises operating in an industry, there are of course various regulatory mechanisms of the private good type (such as subsidies, tax exemptions, *etc.*). As in our previous study, we rely on a rather plausible assumption that the possibilities to receive these enterprise-specific transfers do not undermine the desire to lobby for industry-specific tariffs, other things being equal.

variable *AvSales* approximates the volume of sales.[12] It is important to note that Russian statistics present data for *enterprises*, not for *companies*, so we are not able to take into account the fact that several plants could be controlled by the same company; this limitation must be taken into account when interpreting our results. Finally, the dummy variable for intermediate good sectors (*DInt*) should allow us to capture the possible tariff escalation bias associated with the lobbying process (Case 2 in Section 3.2).[13]

Let us now consider government motives that are not related to the maximization of lobbying contributions. If the government maximizes the conservative social welfare function, it could try to assist with the tariffs primarily those industries that employ a large number of workers (*ShEmp*) and suffer from an adverse financial situation (*Loss*). The number of enterprises in the respective industries (*NEnt*) could also be used to control for the size and the geographical dispersion of the "industrial electorate."[14] On the other hand, if the government is revenue-constrained and its major concern is associated with maximizing tariff revenues, it could pay principal attention to levying high tariffs on those items that account for the highest share in imports ($ShImpl_j$). In this case it can receive the highest revenues from a given percentage increase in tariff rates, while at the same time abstain from increasing tariffs on "less important" import articles and thus from inducing additional distortions in the economy.

In our previous study we have found that the variables associated with the conservative social welfare motive and the revenue motive (Cases 3 and 4 in Section 3.2) provide the best explanation of the tariff structure in Russia. To describe this effect, the "stagnant industries – tariff revenues" hypothesis was introduced. The introduction of more elaborate variables intended to test the pressure group hypothesis (Cases 1 and 2) allows one to take into account both possible lines of argument. Table 2 contains information on the expected direction of influence exercised by

[12] The other reason why this variable could be important for the activity of pressure groups (besides the reason described in the previous section) is that a higher scale of operations implies higher costs of entry, and thus lower probability of the dissipation of rents associated with protection.

[13] As distinct from Case 1 in Section 3.2, we concentrate our attention here only on variables related to the activity of pressure groups, and thus ignore the possible interest of the government in raising tariff revenues.

[14] As the variables *NEnt* and *ShEmp* in our database refer to different levels of aggregation, we will be able to answer the question concerning the preferences of the government to support broad versus specialized industrial groups.

each independent variable on tariff rates, with the signs "+" and "−" denoting positive and negative influence, respectively.

Table 2. The Expected Influence of Independent Variables on Tariff Rates.

Independent Variables	The pressure group hypothesis	The stagnant industries – tariff revenues hypothesis
Import penetration ($ShImp_{ij}$)	+	+
Output decline (ΔOut)	+	+
Number of enterprises (*NEnt*)	–	+
Industry concentration (*Sh*4)	+	
Average level of sales (*AvSales*)	+	
Share in total imports ($ShImpl_j$)		+
Share of employment (*ShEmp*)		+
Share of loss-making enterprises (*Loss*)		+
Intermediate goods dummy (*DInt*)	–	

The easiest to calculate variable to be used as a measure of import penetration is the share of imports in national consumption in physical terms. This variable has some limitations, however. First, it does not take into account quality differentiation of trade articles imported and produced at home. To control for the quality differences, we should analyze the value measures of import penetration, assuming that the prices for home-produced and for imported articles reflect the quality dimensions important to consumers (this proposition is widely used in research practice; see, *e.g.*, Torstensson, 1991; Greenaway *et al.*, 1995). Second, some trade goods (*e.g.*, photo cameras) are intensively *re*-exported from Russia, so that the total volume of imports *exceeds* the volume of national consumption. As the measures of import penetration exceeding the 100 per cent level have quite ambiguous meaning, it is also worth considering the share of the total market served by imported goods. Therefore, we propose to use various measures of the market share of imports — $ShImp_{ij}$ (the subscript i here denotes the method of calculation, whereas the subscript j denotes the type of trade flows: $j = 1$ for trade with non-CIS countries and $j = 2$ for the total foreign trade):

$ShImp_{1j}$ is the physical measure of import penetration on the national market calculated according to the formula $ShImp_{1j} = M_j^* 100/(Q + M_j - E_j)$,

where M_j is the physical volume of imports, Q is the physical volume of national output, and E_j is the physical volume of exports;

$ShImp_{2j}$ is the value measure of import penetration on the national market calculated according to the formula $ShImp_{2j} = VM_j^* 100/(VQ + VM_j - VE_j)$, where VM_j is the value of imports, VQ is the value of national output, and VE_j is the value of exports;

$ShImp_{3j}$ is the physical share of the total market (*i.e.*, the national market as well as the market for exports) served by imports, calculated according to the formula $ShImp_{3j} = M_j^* 100/(Q + M_j)$;[15]

$ShImp_{4j}$ is the value share of the total market served by imports, calculated according to the formula $ShImp_{4j} = VM_j^* 100/(VQ + VM_j)$.[16]

Our set of import penetration variables is not without deficiencies, however. They refer to the registered imports only, and thus characterize the levels of import penetration observed by the government rather than faced by pressure groups. Thus, the data at hand are more adequate for testing the stagnant industries – tariff revenues hypothesis than the pressure group hypothesis. In the latter case, the government reacts not to the observed levels of import penetration but rather to the lobbying contributions that depend on the "real" levels of import penetration. There are at least three major sources of difference between the officially registered and "real" volume of imports. First, a significant part of imported goods enters Russia through the so-called "shuttle trade" channels (*i.e.*, being imported by individuals rather than legal entities) evading registration by customs officials. Second, since 1995 trade with Belarus is exempt from customs treatment (according to the Goskomstat figures, in 1997 imports from Belarus totaled $4.626 billion, compared with $53.039 billion of registered imports). Goskomstat corrections for

[15] From this point on we will use the terms "import penetration" and "market share of imports" interchangeably for the sake of simplicity, though it should be kept in mind that for the total market (embracing national as well as export markets) the term "market share of imports" is more appropriate.

[16] Values of the variables M_j, E_j, VM_j, VE_j are taken directly from the foreign trade statistics (*The Customs Statistics of Russian Foreign Trade* for 1997). The variable Q is taken from *The Industry in Russia* yearbook for 1997. To calculate the variable VQ, we multiply the variable Q by the weighted export price index P calculated according to the formula:

$$P = (VE_1/E_1)\times(VE_1/VE_2) + [(VE_2 - VE_1)/(E_2 - E_1)]\times[(VE_2 - VE_1)/VE_2)],$$

where VE_1 is the value of exports to non-CIS countries, VE_2 is the value of total exports, $(VE_2 - VE_1)$ is the value of exports to CIS countries; the variables E_1, $(E_2 - E_1)$, and E_2 refer to the physical volume of exports to non-CIS countries, CIS countries, and total exports, respectively.

these two sources of non-registered imports for 1997 amount to $20.421 billion, with the total imports estimated at $73.460 billion. Third, Russian importers intensively use various "grey-import" schemes ranging from misspecifying imported goods as articles destined for re-export to misreporting the type of goods.[17] Given the three problems specified, is there any sense to use official import data to test propositions that have to do with the pressure group hypothesis?

The most straightforward case for the positive answer on this question is that any other "explicit" data are absent. "Shadow" imports, by the very nature of this word, are unobserved imports, and any non-official estimates are in fact nothing more than rough guesses. Nevertheless, one could suggest that some import positions are more likely to attract shadow importers than others. This line of reasoning, meanwhile, leads us to our second argument: given the prevalent demand pattern, it is likely that the share of shadow imports is higher just for those goods that are intensively imported through the official channels. Thus, official data on import penetration could serve as a reasonable proxy for the "true" import penetration (this argument applies for capital as well as consumer goods, whereas in the former case in which the "shuttle" imports are apparently negligible, the possibilities to misspecify imported items or to transport them through Belarus are still open). Finally, we have a kind of asymmetric *ex post* verification criterion: if we find no relationship between import penetration and tariff rates, it could of course be suggested that this result is due to the invalid specification of the import penetration variables; if, on the contrary, we *do* find a relationship of the predicted sort, it would mean that the import penetration variables chosen, despite all their deficiencies, allow us to capture at least some features of the political economy process.

4.2. The Import Penetration Model

This model is used to assess the degree of import penetration in different industries assuming that levels of trade protection are determined exogenously. According to equation (3.2') in Section 3.3, inter-industry differences in import penetration are explained in terms of factor intensi-

[17] *E.g.*, chicken (with a 25 per cent tariff rate) was misspecified as turkey (with a 15 per cent tariff rate), TV-sets (for which a compound tariff rate with a 30 per cent ad valorem component is applied) was misspecified as consumer electrical machines (with a 20 per cent ad valorem tariff rate), flowers (with a 25 per cent tariff rate) were misspecified as greenery (with a 5 per cent tariff rate), to cite the most notorious examples of the period under consideration.

ties of production, and the level of scale economies is approximated by the quality index variable:

$$ShImp_{ij} = b'_1 + b'_2 Rate + b'_3 PhCap + b'_4 Mat + b'_5 Lab_1 + \\ + b'_6 Lab_2 + b'_7 HCap + b'_8 Qual + \varepsilon_2; \quad (4.2)$$

where

PhCap is the measure of capital intensity calculated as the share of amortization in total production costs (in per cent);

Mat is the measure of material intensity calculated as the share of expenditures on raw materials, semi-finished goods and other materials in total production costs (in per cent);

Lab_1 is the measure of labor intensity calculated as a share of wages in total production costs (in per cent);

Lab_2 is the alternative measure of labor intensity calculated as a share of total labor expenses (*i.e.*, expenses on wages as well as various social payments) in total production costs (in per cent);

HCap is the measure of human capital intensity calculated as the share of professionals (engineers, technicians, managers, *etc.*) in the industrial labor force;

$Qual_j$ is the index of quality differences in intra-industry trade as reflected by the differences in prices for imported and exported goods in trade with non-CIS countries ($j = 1$) and in total foreign trade ($j = 2$).

All independent variables are taken for the year 1997. The variables *PhCap*, *Mat*, Lab_1, Lab_2, and *HCap* are calculated for 27 industrial sectors;[18] the variables *Rate* and *Qual* are taken for individual commodity types.

In the Import Penetration model, the variable *Rate* holds for the trade costs, and the variables *PhCap* through *HCap* denote factor intensities of production. In these respects, the structure of our model resembles that of Trefler's model (1993). Giving principal attention to the comparative advantage variables seems to be quite reasonable in the Russian case due to the key roles attributed to them in explaining the trade between developing and developed countries (Helpman, 1999), with the devel-

[18] It should be noted that these variables representing production cost shares do not actually sum up to 100 per cent. Russian statistics also include "other costs" that comprise taxes, payments for services provided by other organizations, leasing payments, *etc*.

oped countries being the main trade partners of Russia. Moreover, the analysis of comparative advantage may be fruitful even for studying problems usually addressed within the framework of the New Trade Theory (Davis, 1997).

We also include in our Import Penetration model the variable $Qual_j$, which is intended to characterize technological differences in production at home and abroad. We assume that foreign trade in the same commodities takes the form of vertical intra-industry trade, *i.e.*, trade in goods with varied quality reflected in price differences. As is discussed in Section 3.3, these quality differences could reasonably be interpreted as reflecting differences in the role of scale economies in production at home and abroad (*i.e.*, higher $Qual_j$ means higher relative scale economies of foreign producers). Thus, the variable $Qual_j$ is implied to capture scale economies in addition to the more traditional Hecksher – Ohlin factor intensities. This variable is calculated according to the following formulas:

$$Qual_1 = (VM_1/M_1)/(VE_1/E_1), \quad (4.3)$$

$$Qual_2 = (VM_2/M_2)/(VE_2/E_2). \quad (4.4)$$

Formula (4.3) is used in models for trade with non-CIS countries, whereas formula (4.4) is used in models for total foreign trade.

4.3. The Simultaneous Equations Model

In this model, we recognize explicitly the fact that the process of endogenous trade policy formation responds to changes in the economic environment (in our case, to changes in import penetration), and these changes are in turn influenced by the level of tariff rates. Note that at the beginning of 1992, Russia abolished all import barriers, so the absolute levels of tariff rates in 1997 correspond to the absolute *changes* in tariff rates during the period 1992 – 1997. The model under consideration supposes simultaneous estimation of the Endogenous Protection equation and the Import Penetration equation. Inspection of this model would allow us to

- compare the predictive value of the independent versus simultaneous estimation of equations (4.1) and (4.3);
- analyze the impact of independent variables on the level of tariff rates and import penetration, with special attention given to the coefficients of the tariff rate variable in the Import Penetration equation and the impact of political economy variables on tariff levels;

- use alternative instrumented variables to estimate the "true" impact of tariff rates on import flows, and vice versa.

Note that models in Sections 4.1 – 4.2 are formulated in such a way as to exclude supplementary endogenous effects. For example, tariffs can influence the level of employment and losses in an industry; however, the variable *Rate* refers to individual commodity types whereas the variables *ShEmp* and *Loss* refer to the broad industrial groups. Likewise, tariff protection could prevent output decline; meanwhile, the variable ΔOut in our models measures the degree of output decline since 1990, not 1992, when the new Russian tariff structure began to be formed. Thus, we do not expect to face regressor endogeneity problems.

5. EMPIRICAL FINDINGS

5.1. Main Results of the Econometric Analysis

For the purpose of the econometric analysis, the database was constructed comprising 113 commodity types for which Russian statistical publications present data satisfying the following criteria: (1) foreign trade statistics are available for *both* the physical volume and the value of trade flows, and (2) physical units used in foreign trade *and* output statistics are identical. These commodity types account for 21.10 per cent of Russian imports from non-CIS countries and 21.89 per cent of total Russian imports. Table A1 contains the basic information on the independent as well as dependent variables calculated from the database. In Tables A2a – A2c, correlation matrixes for the independent variables are presented. As one can readily confirm, the choice of independent variables has in fact guaranteed the absence of significant correlation within the group of the "basic" variables (Table A2a). At the same time, all import penetration variables ($ShImp_{ij}$) are closely correlated to each other (Table A2b). Another feature is that the variables *Mat* and Lab_2 are correlated with other production factor variables (Table A2c). Thus, when estimating the Import Penetration model, we should rely principally on only three production factor variables measuring shares of physical capital costs (*PhCap*), basic labor costs (Lab_1), and human capital intensity (*HCap*).

As the first step of the econometric analysis, 8 variants of the Import Penetration model (with different specifications of the import penetration

variable) and also 8 variants of the Endogenous Protection model were estimated. The results of these tests can be found in Tables A3 and A4a.[19]

As far as the Import Penetration model is concerned (Table A3), in *neither* case does the tariff rates variable exercise a statistically significant influence on the level of import penetration. Another important finding is that import penetration appears to be *higher* for labor-intensive goods and *lower* for capital intensive ones. This is quite surprising given the widespread appeals to the "cheap labor force" and the "worthless physical capital" in Russia.[20]

Our measure of human capital intensity does not seem to serve as an important determinant of import penetration. As far as the quality variable is concerned, it exercises statistically significant *negative* impact on *physical* measures of import penetration in trade with non-CIS countries but *positive* impact on *value* measures of import penetration in the total foreign trade. Given our interpretation of quality differences as indicators of scale economies, the latter effect seems to be quite natural: a higher gap between the quality of imports and exports (in our basic interpretation, higher relative scale economies of foreign producers) is associated with higher import penetration. At the same time, assuming that one higher-quality item is a substitute for several lower-quality ones, and given consumers' budget constraints, one can explain (though in a rather *ad hoc* way) lower import

[19] Different variants of the Import Penetration models, when estimated in their original formulation, demonstrated heteroscedastic properties which appeared to be principally related with the variable *Lab*_1. Assuming the variance in the dependent variable being proportional to the value of the variable *Lab*_1 (*i.e.*, $\sigma_i^2 = \sigma^2 \, Lab\_1_i$), coefficients in the Import Penetration model were estimated using the transformed regression model scaled by the square root of the variable *Lab*_1.

[20] It could be suggested that at least part of this puzzle could be explained by the differences in productivity of labor and capital employed in different industries (just as the paradoxical pattern of factor content of trade between developed and developing countries could be explained by factor productivity differences in the respective countries; cf. Trefler, 1995). To test this suggestion, we tried to control for the productivity effect by introducing into the Import Penetration model additional variables (for 8 major industrial sectors) related to the inter-sectorial differences in wages (intended to reflect labor productivity differences) and inter-sectoral age structure of capital (we assumed that the newest capital goods tend to be the most productive ones). Both these variables, however, appear to be statistically insignificant.

penetration in physical terms in trade with non-CIS countries for higher-quality goods.[21]

Let us turn now to the Endogenous Protection models (Table A4a). We should note that *none* of the import penetration variables exercise any statistically significant influence on tariff rates. In many other respects the findings correspond to our expectations summarized in Table 2. The measure of output decline, the average level of sales, the share of loss-making enterprises and the intermediate goods dummy exercise influence on tariff rates in directions predicted by the pressure group hypothesis as well as by the stagnant industries – tariff revenues hypothesis. Coefficients of the commodity shares in imports are statistically significant with the expected sign when they refer to imports from non-CIS countries ($ShImpI_1$) but not to total imports ($ShImpI_2$).[22]

One finding that goes contrary to the logic of the pressure group hypothesis but corresponds to the stagnant industries – tariff revenues hypothesis is that a number of enterprises (the variable *NEnt*) exercises a *positive* impact on tariff rates. As there is no statistically significant impact of the variable *ShEmp* that refers to the more aggregated industrial groups, it could be suggested that the government is able to discriminate effectively between quite specialized industrial groups.[23]

---

[21] It could also be suggested that imports of goods with the highest quality gap between foreign and domestic producers, being highly profitable, are more likely to enter Russia through "shadow" channels, and thus we face an sort of the "missing trade phenomenon" in the official statistics.

[22] The same result was obtained in the previous study (Afontsev, 2000) for both 1996 and 1997. One possible explanation has to do with the composition of trade with CIS and non-CIS countries: levying high tariffs on manufactured goods with high value-added (imported principally from non-CIS countries) can generate more budget revenues than levying tariffs on low value-added imports from the CIS. The problem of tariff evasion can also play a role: as borders with CIS countries, as is widely recognized, were "semi-limpid" for the most part of the 1990s, concentration on imports from non-CIS countries was the most adequate strategy to maximize tariff revenues.

[23] An alternative interpretation could also be proposed: there could be "two-tier" lobbying, with enterprises appealing to regional authorities and State Duma (the Russian parliament) representatives to use *their own* lobbying potential to address the government. If so, as a higher number of enterprises could reflect the geographical dispersion of industries, their interests will be represented by a higher number of regional officials and MPs. Moreover, as has been noted in Section 4.1, our models do not take into account the possibilities of overlapping corporate ownership or membership of several enterprises in financial-industrial groups (indeed, these possibilities could be of crucial importance for pressure group activity in the real world). This fact should be kept in mind when interpreting regression results.

Econometric findings presented thus far seem to correspond to the initial skeptical view on the analytical potential of independent treatment of the Endogenous Protection model and the Import Penetration model. In these models, neither tariff rates influence the import penetration level nor do import penetration measures influence the level of tariff rates. We should thus proceed to the exercise of verifying expectations about the simultaneous treatment of these models. As a step for this exercise, we performed the Hausman test for endogeneity by introducing values of the tariff rate variable predicted from the different variants of the Endogenous Protection model into the respective variants of the Import Penetration model, and, in turn, the import penetration variables predicted from the different variants of the Import Penetration model into the respective variants of the Endogenous Protection model.

The results are noteworthy. Tariff rates predicted from the Endogenous Protection models exercise statistically significant *positive* impact on the import penetration variables, which of course can not be explained by any reasonable line of argument related to the impact of tariff rates on import flows.[24]

On the contrary, the inclusion of the predicted import penetration variables — EST($ShImp_{ij}$) — into the Endogenous Protection model leads to a notable improvement in the model performance. This effect is evident from Table A4b. These instrumented variables are always highly significant with the predicted sign. At the same time, in contrast to the "independent" estimation of the Endogenous Protection model, the coefficient of the output decline variable ΔOut turns out to be statistically insignificant, while the coefficient of the industry concentration variable *Sh*4 becomes statistically significant with the predicted sign. The impact of the variables *Loss* and *DInt* is significantly weakened and could be found principally in the models for total foreign trade, while in the models for trade with non-CIS countries (which as a rule explain a larger portion of variation in tariff rates), it is less obvious.

As could be seen from Table A4b, the "two-stage" endogenous protection model for the variable of the market share of imports in value terms in trade with non-CIS countries ($ShImp_{21}$) outperforms all alternative specifications. Tariff rates predicted from this model seem to be quite reasonable. It is especially interesting to analyze outliers of the model, *i.e.*, cases when predicted tariff rates deviate significantly from the actual ones. In two cases, the model predicts *negative* tariff rates; no wonder,

[24] We experimented also with a dummy variable for the commodity groups for which compound tariffs are imposed. Its inclusion does not change the results presented above.

these cases are crude oil and natural gas, *i.e.*, commodities in which Russia has the most favorable export position. In the case of chicken meat, higher actual tariff rates are quite natural in the light of intensive and well-publicized protectionist campaigns throughout the 1990s. On the contrary, actual tariff rates are much lower than predicted for agricultural machines, mining equipment, railway coaches, salt, bread, corn oil, and baby food. These commodities are usually considered by the government to be either "socially important" or crucial for the economy due to the lack of adequate local substitutes. In the case of the fish products and coal low tariff rates could be due to the endowments in specific natural resources. Thus, *ad hoc* arguments seem to provide quite reasonable explanations for major (but of course not all) model outliers.

What do the findings presented in this section tell us as far as the understanding of the mechanism of tariff protection is concerned?

- First, tariff rates appear to exercise *no* negative impact on the measures of import penetration, which is, of course, a quite unexpected finding. The most probable reason is that the degree of variation in tariff rates was radically reduced by the decision made in 1996 to fix the maximum tariff rate at the 30 per cent level (this decision was in fact inspired by IMF recommendations). What is even more surprising, import penetration is higher for labor intensive goods and lower for capital intensive goods. Part of this puzzle could be explained by the fact that import penetration appears to be higher for consumer goods due to the significant demand for higher quality imported goods by consumers, as well as the liquidity constraint on Russian producers, who often do not have the money to buy more productive but at the same time more expensive imported equipment. As producer goods tend to be more capital intensive than consumer goods, the counterintuitive import pattern could reflect not the presumed "efficiency" of Russian capital intensive industries, but solely demand conditions. However, this explanation is not universal. For example, when we consider only consumer goods ($Dlnt = 0$), the positive relationship between labor intensity and import penetration is even more pronounced.[25]

[25] For example, in the model with the value measure of the import penetration in trade with non-CIS countries ($Shlmp_{21}$) the coefficient of the variable *Lab*_1 rises from 1.65 to 3.27, while its beta coefficient rises from 0.13 to 0.25 (this means that a one-standard-deviation change in the value of the variable *Lab*_1 in the transformed model changes the import penetration variable by 0.25 standard deviation). This fact suggests that the regularity found is unlikely to be induced by the deficiency of the official data, as the structure of "shadow" imports is much more biased toward consumer goods than the structure of registered imports.

- Second, the lack of a negative effect of the tariff rate measures predicted from the Endogenous Protection model on the market share of imports in the Import Penetration model forces us to reject our initial assumption of "two-way" endogeneity, with the import penetration variable affecting the level of tariff rates, and vice versa. Thus, we can treat import penetration levels as "independent" of the political economy processes that determine tariff rates.

- Third, the import penetration variable predicted from the Import Penetration model, when introduced into the Endogenous Protection model, exercises a highly significant impact on tariff rates and assures a noticeable rise in the predictive value of the model, while most of the other variables exercise an impact on tariff rates in agreement with the logic of endogenous policy theory. Moreover, many outliers of the model are amenable to plausible interpretation.

The results presented above could be judged as robust only if they do not depend on the choice of commodity types included in our database. As the main principle of the database formation and the calculation of independent variables was that of data availability, we should perform extensive sensitivity analysis to make sure that the findings presented above are not influenced by some bias in the available data.

5.2. Sensitivity Analysis

First of all, it is worth testing the sensitivity of the results described in the previous section to changes in the industry set of observations. For this purpose, we should see whether the omission of observations for different industrial sectors would influence the results significantly. Detailed results for 8 broad industrial sectors are presented in Tables A5, A6a, and A6b.[26]

One can easily make sure from Table A5 that a statistically significant negative relationship between the measure of physical capital intensity and the level of import penetration is evident in all specifications (though

[26] As the Endogenous Protection model for the value measure of the import penetration in trade with non-CIS countries ($ShImp_{21}$) appeared to perform best, sensitivity analysis results are presented here for both the Import Penetration model and the Endogenous Protection model where this variable is employed. We also estimated the Import Penetration model as well as the Endogenous Protection model with the omission of observations for 27 less aggregated industries. The results of these tests, while supporting the general findings, are less representative because the number of commodities associated with these industries varies significantly (from 1 to 19).

the coefficient of this variable fluctuates from 0.98 to 4.47). The impact of the labor intensity measure is always positive and statistically significant (with one exception); in those variants where it is statistically significant, its coefficient varies much less, from 1.29 to 2.10. However, the beta coefficients for the physical capital intensity measure are as a rule higher.

One interesting finding is that our measure of human capital intensity is highly significant when observations for the food industry are excluded. We could thus suppose that the food industry is in some sense an "outlier" in our database.[27] At the same time, neither tariff rates nor the quality variable exercise the expected impact on the degree of import penetration.

To explore the sensitivity of the Endogenous Protection model to the exclusion of industry observations, two tests were performed:

- the "soft" test, where the import penetration variables predicted from the basic variant of the Import Penetration model (presented in the second column of Table A5) were used, and
- the "strong" test, where the import penetration variables were predicted from the Import Penetration models in which the observations for the respective industries were excluded (actually, from the Import Penetration models in columns 3 – 10 of Table A5).

The first test controls for industry-specific sources of variation peculiar to the endogenous protection mechanism. In turn, the "strong" test controls for two sources of variation peculiar both to the trade sphere and to the endogenous protection mechanism. In a sense, it rests on quite strong assumptions. It addresses the following question: what would have been the political economy mechanism of tariff protection in Russia if its foreign trade had "lost" one of its sectors, with trade flows in all other sectors being unaffected. For the results of these tests, see Tables A6a and A6b.

One striking finding from the different specifications of the Endogenous Protection model is that the impact of the predicted import penetration variable EST($ShImp_{21}$) is highly significant (when judged by both *t*-statistic and beta coefficients) in all specifications of both tests. Moreover, coefficients of this variable are quite reasonable: in our "soft" test,

[27] Indeed, the food industry items in the database could be classified into four sub-industries: nutrition (13 observations), meat & milk (9 observations), fish (5 observations), and flour (3 observations). The statistically significant impact of the measure of human capital intensity appears only when the observations for the nutrition industry are omitted.

they vary from 0.41 to 0.56, while in the "strong" test, which rests on much more radical assumptions, they range from 0.30 to 0.58.

Among other independent variables, the "less stable" performers are the variables characterizing the employment share (*Emp*), the share of loss-making enterprises (*Loss*), and the intermediate product dummy (*DInt*). The signs of the coefficients of these variables generally agree with our expectations, though their statistical significance depends on excluding different industry observations.

On the other hand, the impact of the group of variables characterizing the number of enterprises (*NEnt*), industry concentration (*Sh*4), average sales (*AvSales*), and the share in total imports ($ShImpI_1$) is much more stable. Note also that the beta coefficients for the variables *NEnt*, *Sh*4, and $ShImpI_1$ are generally much higher than for the variable *AvSales*, signifying a higher economic significance of these variables in explaining possible changes in tariff rates.

As in the case of the Import Penetration model, the industries whose exclusion leads to the most important changes in the regularities observed are the machine-building and the food industry. *Note, however, that the exclusion of the observations for these industries neither "neutralizes" the impact of the predicted import penetration variable nor gives rise to any statistically significant effect in contrast with our expectations concerning the impact of individual variables.*

As the impact of some independent variables in the Endogenous Protection model is sensitive to the exclusion of industry observations, it is worth studying the sensitivity of the Endogenous Protection model to the exclusion of different independent variables. This issue is addressed in Table A7. The predicted import penetration variable is the most significant variable in the sense of the values of the beta coefficients, and its impact is quite insensitive to the exclusion of other independent variables (with the coefficient of this variable in the range from 0.43 to 0.48). The other variables have lower beta coefficients, and thus their exclusion affects the predictive power of the model less significantly than the exclusion of the predicted import penetration variable.

This observation allows us to stress the validity of using official data on imports in our empirical analysis despite the problems noted in Section 4.1. Indeed, by identifying the import structure as explained by factor proportions and technology, we approximate the "true" levels of import penetration as distinct from those directly observed by the official statistics. The fact that the impact of these "approximated" import penetration variables is always highly stable in all sensitivity specifications supports *ex post* the adequacy of our modeling procedure.

Coefficients of the variables *NEnt* (the number of enterprises), *Sh*4 (industry concentration), *AvSales* (average sales), and $ShImpl_1$ (the share in total volume of imports from non-CIS countries) are also stable and statistically significant, while the coefficients on the variables *Loss* (the share of loss-making enterprises) and *DInt* (intermediate goods dummy) are statistically significant (with the expected sign) only when some other variables are excluded. In models which include the predicted import penetration variable, the variables ΔOut and *ShEmp* are never statistically significant, and their beta coefficients are very low.

Thus, we can conclude that the findings described in the previous section are reasonably stable to the exclusion of observations for different industry groups and independent variables. Moreover, such exclusion sometimes provides new information on the behavior of the variables whose impact was found to be not statistically significant in the basic formulation of the models. This means that we succeeded in capturing some profound aspects of the import protection process as well as important determinants of the import penetration structure.

6. CONCLUSIONS AND POLICY IMPLICATIONS

We have found that the tariff formation process in the institutional setting that evolved in Russia during the 1992 – 1997 period appears to be significantly influenced by different political economy factors that are addressed within the endogenous protection theory. The most important findings could be summarized as follows.

- *The level of import penetration seems to be unaffected by tariff rates*. No traces of the negative influence of tariff rates (whether actual or predicted) on the level of import penetration were discovered. The main cause of this rather paradoxical result is almost certainly the decision taken by the Russian government in 1996 to set the maximum tariff rate at the 30 per cent level. This decision was in fact inspired by IMF recommendations related to tariff unification, one of the conditions connected to providing IMF credits. Thus, the interaction with an external institutional entity limited the scope for political choice for Russian decision-makers; as a result, the variation in tariff rates has been substantially lower that the variation in most other variables, as can be seen from Table A1. This "neutrality" of tariff rates does not mean, however, that the effects of protection are entirely harmless, as import tariffs in any case exercise upward pressure on domestic prices and thus redistribute income from consumers to producers.

• *There are convincing signs of a counterintuitive relation between the factor cost shares and the measures of import penetration*. The observation that Russian imports appear to be labor intensive rather than capital intensive contradicts the stylized beliefs about the structure of comparative advantage in Russian foreign trade. Our test of the effect of intersectoral productivity differences failed to discover any statistically significant relationship. Thus, further study is needed to identify the determinants of the Russian import structure in lines with the recent efforts to explain the apparent contradictions between trade patterns in the real world and the predictions of the Hecksher – Ohlin – Vanek theorem.

• *Import penetration determined by factor intensity variables appears to be the most important determinant of tariff rates*. In contrast with the more traditional endogenous protection models that use actual values of import penetration, our models with the predicted import penetration variables allow us to explain a substantially higher share of variation in tariff rates. The impact of the predicted import penetration variables is highly stable in respect to the set of industry observations as well as other variables included in the Endogenous Protection model. Thus, we can conclude that the institutional system of tariff policy formation in Russia favors protection of industries whose low competitiveness in foreign trade is caused by the comparative advantage factors.

• *No single hypothesis could be interpreted as an unambiguous explanation of the tariff formation process*. Statistically significant impact on tariff rates is exercised by variables which refer to both hypotheses presented in Section 4.1. On the one hand, the impact of industry concentration (*Sh*4) and the average level of sales (*AvSales*) — as well as the impact of the intermediate goods dummy in some sensitivity specifications — corresponds to the logic of the pressure group hypothesis. On the other hand, the impact of the variables characterizing the number of enterprises (*NEnt*) and the share in imports from non-CIS countries ($ShImpl_1$), as well as the share in total employment (*ShEmp*) and the share of loss-making enterprises (*Loss*) in some sensitivity specifications, supports the stagnant industries – tariff revenues hypothesis. As can be seen, the theoretical framework proposed in Sections 3.1 – 3.2 provides some kind of synthetic analytical description of the tariff-setting mechanism operating in Russia during the transition period.

Our findings confirm the assumption common in the literature on endogenous protection that political economy factors play the principal role in the tariff formation process. In this setting, is there any scope for trade policy improvements, given (1) the desire of policy makers to provide at least moderate support for stagnant industries, (2) the role of

tariff revenues in financing government expenditures, and (3) the evidence of pressure group influence on government decisions?

The most straightforward conclusion one could be tempted to make is that the necessary condition for changing the "protectionist" attitude to a more liberal one is the substitution of "political technocrats" for "political opportunists" in key decision making positions and/or restructuring the entire institutional mechanism of trade policy formation to impose constraints on decision makers, forcing them to reject the protectionist bias. However, radical proposals of this sort rest on rather shaky foundations. Institutional structures are often not easy to change, and a benevolent political technocrat is a *rara avis* indeed. It seems that a much more realistic way of addressing the problem would be to analyze the possibilities of *meeting government preferences while at the same time reducing the degree of distortions introduced in the economy*.

As was suggested above, the obligation not to raise tariffs above the 30 per cent level decreased the scope of the government's autonomy in tariff policy and thus limited the impact of tariff policy on trade flows, as indicated by the absence of any statistically significant impact of tariff rates on import penetration levels. Further reduction of the maximum tariff rate with the appropriate adjustments in the tariff structure will hardly affect the level of import penetration (given our finding about the "neutrality" of tariff rates). Thus, producers' losses from price reductions will be moderated by the stability of the market share of imports; as a consequence, pressure group opposition against lowering the maximum tariff rate is unlikely to be harsh.

The "neutrality" of tariff rates also suggests that the decrease in government revenues due to lower tariff rates will not be compensated for, as the import volume will not rise substantially. Thus, there could be a temptation to make up for the loss of revenues by raising tariffs on goods that previously enjoyed low tariff rates. This "revenue temptation" is rather dangerous, as the cumulative effect of reducing the maximum tariff rate while at the same time raising tariffs "from the bottom up" would not necessarily be liberalizing. More adequate measures for raising tariff revenues include upgrading customs discipline and closing channels for "grey" imports. These measures will not only generate additional revenues for the budget but also raise support by import-competing producers who would be more eager to accept the "bundle" of government policies which supposes lower tariffs *but* higher barriers for illegal imports.

Finally, there is a need to reconsider the role of tariffs in protecting stagnant industries. Given the large variance in enterprise performance, tariffs are quite imprecise instruments of industrial policy as they "protect"

enterprises irrespective of their ability to adjust to the prevalent degree of import competition. Microeconomic policies of industrial restructuring seem to be more appropriate than tariffs for raising the competitiveness of enterprises, allowing the government not only to help these enterprises but also to generate additional tax revenues (and, in the case of enterprises with government stakes in property, to raise the market value of these stakes) due to the rise in enterprise efficiency.

In the recent years, we have been observing a trend toward trade policy reform in lines with some of our recommendations. In September, 2000, the Russian government approved the new concept of customs and tariff policy prepared by the Ministry of Economic Development and Trade. This concept suggests (1) lowering the maximum tariff rate from 30 per cent to 20 per cent, (2) unification of the customs regime for goods within broad commodity groups and (3) a variety of measures intended to fight "grey" import schemes. On November 27, 2000, the government approved a set of revisions to the customs tariff in lines with this concept. New tariff rates are supposed to apply for 9 months (January – September, 2001); then a more strategic decision should be taken.

As far as the main principles of the concept are concerned, the first and the third ones are quite reasonable, while the second one could be subjected to what we called "revenue temptation" (raising rates within individual commodity groups to the level applied to high-tariff articles to undermine stimuli for misreporting them for low-tariff ones). This temptation bears a risk of inducing additional distortions in the economy. It also could be self-defeating, as positive stimuli to shift from "grey" to legal import operations generated by strengthening customs discipline would be counterbalanced by higher tariff rates. At the same time, there are no signs that the government recognizes either the suboptimality of the tariff policy for supporting impaired industries or the connection between tariff policy and enterprise restructuring. Thus, our recommendations do not lose their political appeal in the face of the steps toward reform of the tariff system made during the last years.

A final word should be said regarding the problem of adjusting the Russian tariff structure in a way as to qualify for joining the World Trade Organization. Even with all their rational elements, the current tariff innovations of the Russian government are very far from the WTO standards. One can thus hope that the activation of negotiations with the WTO member countries would force the government to reject the "revenue temptation" and consider the restructuring option as a promising alternative for tariffs in the field of raising competitiveness of national enter-

prises. In this sense, the motivation to join the WTO could have the same liberalizing effect on the Russian tariff structure as the desire to receive the IMF credit resources in 1996, with the lucky differences from the latter case being the lack of "credit addiction" and speeding up the pace of industrial growth.

STATISTICAL APPENDIX

Table A1. Summary Information on the Variables of the Study.

Variable	Observations	Mean	Std. Deviation	Min	Max
Rate	113	12.96	7.72	0	30
$ShImp_{11}$	113	24.65	27.88	0	100.7
$ShImp_{21}$	113	22.53	25.76	0	122.1
$ShImp_{31}$	113	22.31	26.90	0	99.8
$ShImp_{41}$	113	20.09	23.64	0	99.9
$ShImp_{12}$	113	30.18	29.33	0.04	121.6
$ShImp_{22}$	113	27.29	28.99	0.05	172.9
$ShImp_{32}$	113	25.95	27.46	0.01	99.8
$ShImp_{42}$	113	23.11	24.68	0.03	99.9
ΔOut	113	61.14	35.00	−184.99	97.22
NEnt	113	230.95	432.87	3	1875
*Sh*4	113	19.60	17.79	3.22	75.37
AvSales	113	177018.4	1117475	1.36	9946989
$ShImpl_1$	113	0.19	0.37	0	2.28
$ShImpl_2$	113	0.19	0.35	0	1.87
ShEmp	113	3.40	1.98	0.05	7.18
Loss	113	45.15	10.03	23.3	82.4
DInt	113	0.58	0.50	0	1
PhCap	113	6.29	2.46	3.5	18.2
Mat	113	65.14	9.01	38.2	78.8
Lab_1	113	13.42	4.33	6.8	25.7
Lab_2	113	18.41	5.84	9.3	35.4
HCap	113	20.65	4.73	14.71	31.15
$Qual_1$	113	1.317	1.43	0.14	11.71
$Qual_2$	113	2.95	8.35	0.08	71.67

Table A2a. Correlation Matrix for Key Independent Variables.

	Rate	*ShImp*$_{11}$	*ΔOut*	*NEnt*	*Sh4*	AvSales	*ShImpl*$_1$	*ShImpl*$_2$	*ShEmp*	*Loss*	*DInt*	*PhCap*	*Lab*$_1$	*HCap*	*Qual*$_1$	*Qual*$_2$
Rate	1															
ShImp$_{11}$	0.25	1														
ΔOut	0.15	0.38	1													
NEnt	0.43	0.20	0.10	1												
Sh4	−0.01	−0.28	−0.16	−0.29	1											
AvSales	−0.16	−0.13	0.09	−0.08	0.01	1										
ShImpl$_1$	0.32	0.18	−0.04	0.18	0.07	−0.02	1									
ShImpl$_2$	0.16	0.10	−0.06	0.12	0.14	−0.02	0.89	1								
ShEmp	0.08	0.25	0.02	0.18	−0.31	−0.11	0.05	0.04	1							
Loss	0.26	−0.02	−0.03	0.45	−0.30	−0.08	−0.05	−0.10	0.04	1						
DInt	−0.45	−0.41	−0.01	−0.40	0.13	0.13	−0.35	−0.24	−0.23	−0.04	1					
PhCap	−0.16	−0.21	−0.18	−0.14	0.11	0.12	−0.28	−0.14	−0.34	0.24	0.44	1				
Lab$_1$	0.31	0.20	0.22	0.15	−0.24	0.04	−0.20	−0.26	−0.12	0.50	0.02	0.26	1			
HCap	−0.07	−0.05	−0.01	−0.27	0.27	0.17	−0.07	−0.09	−0.64	−0.21	0.21	0.45	0.26	1		
Qual$_1$	−0.08	−0.14	0.004	−0.16	0.04	−0.06	−0.08	−0.10	−0.18	−0.01	0.26	0.04	0.15	0.21	1	
Qual$_2$	−0.13	−0.09	0.09	−0.10	−0.01	−0.03	−0.05	−0.05	−0.23	−0.09	0.19	0.04	0.19	0.29	0.58	1

Table A2b. Correlation Matrix for the Import Penetration Variables.

	$ShImp_{11}$	$ShImp_{21}$	$ShImp_{31}$	$ShImp_{41}$	$ShImp_{12}$	$ShImp_{22}$	$ShImp_{32}$	$ShImp_{42}$
$ShImp_{11}$	1							
$ShImp_{21}$	0.88	1						
$ShImp_{31}$	0.98	0.86	1					
$ShImp_{41}$	0.86	0.96	0.87	1				
$ShImp_{12}$	0.94	0.90	0.92	0.87	1			
$ShImp_{22}$	0.83	0.96	0.81	0.89	0.91	1		
$ShImp_{32}$	0.94	0.88	0.96	0.89	0.97	0.87	1	
$ShImp_{42}$	0.83	0.93	0.84	0.97	0.90	0.92	0.92	1

Table A2c. Correlation Matrix for Production Factor Variables.

	PhCap	*Mat*	Lab_1	Lab_2	*HCap*
PhCap	1				
Mat	−0.77	1			
Lab_1	0.26	−0.75	1		
Lab_2	0.27	−0.75	0.99	1	
HCap	0.45	−0.45	0.26	0.27	1

Table A3. The Import Penetration Model.

	$ShImp_{11}$	$ShImp_{21}$	$ShImp_{31}$	$ShImp_{41}$	$ShImp_{12}$	$ShImp_{22}$	$ShImp_{32}$	$ShImp_{42}$
Y-intercept	14.21 1.14	−1.01 −0.08	17.63 1.49	4.69 0.45	16.65 1.18	6.03 0.39	21.27 1.63	15.53 1.34
Rate	0.47 1.19	0.41 1.11	0.38 0.98	0.34 0.93	0.40 0.95	0.32 0.82	0.27 0.66	0.26 0.68
PhCap	−2.27 −2.67***	−2.19 −2.68***	−2.41 −2.85***	−2.25 −2.81***	−2.41 −2.51**	−2.35 −2.69***	−2.60 −2.70***	−2.37 −2.89***
Lab_1	1.65 2.56**	1.42 2.26**	1.40 2.22**	1.01 1.77*	1.68 2.36**	1.57 2.13**	1.31 1.93*	0.93 1.59
HCap	0.07 0.11	0.58 1.06	0.09 0.16	0.51 1.07	0.0015 0.002	0.43 0.66	−0.02 −0.03	0.23 0.45
$Qual_1$	−3.66 −1.73*	0.82 0.53	−4.36 −2.46**	0.99 0.69				
$Qual_2$					0.32 1.04	0.67 3.07***	0.12 0.33	0.70 3.79***
R^2	0.512	0.500	0.485	0.468	0.570	0.555	0.517	0.526
R_a^2	18.44	17.83	16.17	16.89	25.38	33.84	20.27	29.50

Comment. Estimation using Huber/White/sandwich estimator of standard errors.

Coefficients are based on the estimation of the transformed model scaled by the square root of the variable Lab_1.

In the table cells, the first figure stands for the regression coefficient, the second figure stands for the value of the *t*-statistic.

* — significant at the 10 per cent confidence level;

** — significant at the 5 per cent confidence level;

*** — significant at the 1 per cent confidence level.

Table A4a. The Endogenous Protection Model.

	$ShImp_{ij}=ShImp_{11}$	$ShImp_{ij}=ShImp_{21}$	$ShImp_{ij}=ShImp_{31}$	$ShImp_{ij}=ShImp_{14}$	$ShImp_{ij}=ShImp_{12}$	$ShImp_{ij}=ShImp_{22}$	$ShImp_{ij}=ShImp_{32}$	$ShImp_{ij}=ShImp_{42}$
Y-intercept	2.80 0.78	2.43 0.68	3.14 0.78	3.16 0.87	3.86 1.03	3.53 0.96	4.57 1.21	4.42 1.18
$ShImp_{ij}$	0.072 0.30	0.016 0.62	−0.005 −0.20	−0.005 −0.19	0.006 0.27	0.013 0.58	−0.014 −0.59	−0.01 −0.39
ΔOut	0.037 2.91*	0.035 2.71***	0.041 3.19***	0.04 3.12***	0.036 2.72***	0.034 2.53**	0.042 3.29***	0.041 3.07***
NEnt	0.0035 2.07**	0.0035 2.13**	0.0034 1.97*	0.0034 1.96*	0.037 2.28**	0.0038 2.34**	0.0036 2.10**	0.0036 2.14**
Sh4	0.07 1.57	0.075 1.63	0.069 1.51	0.069 1.50	0.078 1.61	0.079 1.65	0.071 1.51	0.073 1.52
AvSales	−6.45 e−7 3.96***	−6.12 e−7 3.71***	−6.79 e−7 4.14***	−6.82 e−7 −4.06***	−6.10 e−7 −3.44***	−5.81 e−7 −3.28***	−6.84 e−7 3.83***	−6.73 e−7 −3.69***
$ShImpl_1$	3.88 2.00**	3.79 1.97*	3.98 2.04**	3.99 2.04**				
$ShImpl_2$					1.34 0.56	1.28 0.53	1.52 0.63	1.51 0.62
ShEmp	−0.036 −0.11	−0.024 −0.07	−0.021 −0.06	−0.026 −0.08	−0.043 −0.13	−0.036 −0.11	−0.026 −0.08	−0.036 −0.11
Loss	0.17 2.45**	0.17 2.57**	0.17 2.39**	0.17 2.41**	0.16 2.31**	0.17 2.40**	0.16 2.19**	0.16 2.22**
DInt	−4.63 −2.80***	−4.57 −2.82***	−4.85 −2.93***	−4.82 −2.97***	−5.41 −3.40***	−5.36 −3.44***	−5.77 −3.61***	−5.63 −3.60***
R^2	0.378	0.379	0.378	0.378	0.352	0.353	0.352	0.352
F	15.37	15.79	14.71	14.72	14.39	14.84	13.31	13.43

Comment. Dependent variable — Rate. Estimation using Huber/White/sandwich estimator of standard errors.

In the table cells, the first figure stands for the regression coefficient, the second figure stands for the value of the *t*-statistic.

* — significant at the 10 per cent confidence level; ** — significant at the 5 per cent confidence level; *** — significant at the 1 per cent confidence level.

Table A4b. The Endogenous Protection Model with Import Penetration Variables Predicted from the Import Penetration Model.

	$ShImp_{ij}$= $ShImp_{11}$	$ShImp_{ij}$= $ShImp_{21}$	$ShImp_{ij}$= $ShImp_{31}$	$ShImp_{ij}$= $ShImp_{14}$	$ShImp_{ij}$= $ShImp_{12}$	$ShImp_{ij}$= $ShImp_{22}$	$ShImp_{ij}$= $ShImp_{32}$	$ShImp_{ij}$= $ShImp_{42}$
Y-intercept	−1.26 −0.37	−3.56 −1.02	−0.96 −0.27	−5.03 −1.25	−2.98 −0.91	−1.41 −0.41	−3.55 −0.93	−1.10 −0.28
EST ($ShImp_{ij}$)	0.38 5.98***	0.44 5.75***	0.32 4.19***	0.49 4.37***	0.38 4.49***	0.22 2.52**	0.39 4.18***	0.20 1.93*
ΔOut	0.006 0.41	0.0038 0.248	0.015 1.00	0.0066 0.45	0.0054 0.35	0.017 1.15	0.0078 0.51	0.0229 1.58
NEnt	0.0029 2.04**	0.0036 2.58**	0.0030 1.95*	0.0035 2.40**	0.0035 2.49**	0.0037 2.55**	0.0035 2.28**	0.0036 2.34**
Sh4	0.075 2.03**	0.081 2.36**	0.074 1.83*	0.071 2.23**	0.091 2.36**	0.089 2.18**	0.089 2.16**	0.087 1.99**
AvSales	−7.06 e−7 −3.22***	−5.34 e−7 −1.927*	−7.31 e−7 −4.25***	−4.77 e−7 −1.79*	−4.22 e−7 −1.84*	−4.92 e−7 −3.31***	−4.42 e−7 −1.88*	−4.68 e−7 −3.48***
$ShImpI_1$	3.62 2.64***	3.47 2.54**	3.61 2.35**	3.13 2.21**				
$ShImpI_2$					2.34 1.19	2.08 0.98	2.19 1.05	1.69 0.77
ShEmp	−0.14 −0.51	0.31 1.16	−0.18 −0.59	0.22 0.79	0.05 0.16	0.22 0.73	−0.11 −0.36	0.10 0.31
Loss	−0.064 1.03	0.078 1.30	0.107 1.65	0.121 2.00**	0.084 1.32	0.13 1.92*	0.11 1.81*	0.17 2.50**
DInt	−1.15 −0.81	−2.13 −1.53	−1.73 −1.11	−2.19 −1.53	−3.19 −2.14**	−4.35 −2.75***	−2.92 −1.92*	−4.62 −2.88***
R^2	0.548	0.570	0.492	0.544	0.500	0.434	0.474	0.402
F	17.12	17.78	16.94	14.41	17.64	21.43	13.14	25.59

Comment. Dependent variable — Rate. Estimation using Huber/White/sandwich estimator of standard errors.

The variable EST($ShImp_{ij}$) is predicted from the Import Penetration model.

In the table cells, the first figure stands for the regression coefficient, the second figure stands for the value of the *t*-statistic.

* — significant at the 10 per cent confidence level; ** — significant at the 5 per cent confidence level; *** — significant at the 1 per cent confidence level.

Table A5. Sensitivity of the Import Penetration Model to the Exclusion of Observations for Different Industry Groups.

		Industry group excluded:							
	Basic specification	Fuel (6 obs.)	Ferrous metallurgy (11 obs.)	Chemistry (22 obs.)	Machine-building (24 obs.)	Wood & paper (8 obs.)	Construction materials (4 obs.)	Light industry (8 obs.)	Food industry (30 obs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Y-intercept	−1.01 −0.08	3.52 0.28	7.06 0.47	−0.90 −0.07	12.04 0.90	1.87 0.15	0.03 0.00	−0.06 −0.01	−30.71 −2.62**
Rate	0.41 1.11 0.12	0.25 0.63 0.08	0.32 0.78 0.09	0.47 1.01 0.14	0.71 1.69* 0.21	0.52 1.41 0.16	0.37 0.98 0.11	0.32 0.82 0.10	0.28 1.04 0.10
PhCap	−2.19 −2.68*** −0.26	−4.47 −2.47** −0.30	−2.20 −2.68*** −0.27	−2.33 −2.58** −0.29	−2.04 −2.38** −0.26	−1.65 −2.08** −0.20	−2.12 −2.61** −0.25	−2.22 −2.75*** −0.27	−0.98 −1.89* −0.14
Lab_1	1.42 2.26** 0.12	2.10 2.41** 0.17	1.29 1.99** 0.11	1.33 1.90* 0.12	0.97 1.55 0.08	1.74 2.62** 0.15	1.53 2.33** 0.13	1.39 2.00*** 0.11	1.59 2.72*** 0.16
HCap	0.58 1.06 0.11	0.68 1.22 0.11	0.33 0.56 0.07	0.57 1.04 0.12	0.17 0.25 0.03	0.04 0.07 0.01	0.48 0.85 0.09	0.59 1.02 0.11	1.43 2.75*** 0.35
$Qual_1$	0.82 0.53 0.04	1.13 0.77 0.06	1.56 1.00 0.08	1.62 1.05 0.09	−2.97 −1.12 −0.11	1.14 0.66 0.06	0.77 0.50 0.04	1.00 0.65 0.05	0.89 0.69 0.06
R^2	0.500	0.522	0.513	0.527	0.487	0.512	0.501	0.480	0.544
F	17.83	18.51	17.65	15.45	12.72	17.20	17.25	15.45	18.82

Comment. Dependent variable — $Shlmp_{21}$. Estimation using Huber/White/sandwich estimator of standard errors.

Number of observations omitted is in parentheses. In the table cells, the first figure stands for the regression coefficient, the second figure stands for the value of the *t*-statistic, the third figure stands for the value of the beta coefficient.

* — significant at the 10 per cent confidence level; ** — significant at the 5 per cent confidence level; *** — significant at the 1 per cent confidence level.

Table A6a. Sensitivity of the Endogenous Protection Model to the Exclusion of Observations for Different Industry Groups — the "Soft Test".

	Basic Specification	Industry group excluded:							
		Fuel (6 obs.)	Ferrous metallurgy (11 obs.)	Chemistry (22 obs.)	Machine-building (24 obs.)	Wood & paper (8 obs.)	Construction materials (4 obs.)	Light industry (8 obs.)	Food industry (30 obs.)
Y-intercept	−3.56 −1.02	−8.65 −2.56**	−5.44 −1.67*	−6.68 −1.72*	0.56 0.15	−1.78 −0.44	−3.57 −1.01	−0.32 −0.08	8.61 1.73*
EST ($ShImp_{21}$)	0.44 5.75*** 0.51	0.56 6.35*** 0.56	0.41 5.98*** 0.48	0.47 4.93*** 0.55	0.49 3.48*** 0.55	0.43 5.63*** 0.50	0.44 5.87*** 0.52	0.41 5.24*** 0.50	0.37 3.99*** 0.45
ΔOut	0.0038 0.25 0.02	0.0013 0.08 0.01	0.0046 0.30 0.02	0.0086 0.60 0.04	0.01 0.93 0.06	0.008 0.59 0.04	0.005 0.36 0.02	−0.0003 −0.02 −0.002	−0.03 −1.61 −0.11
NEnt	0.0036 2.58** 0.20	0.0026 2.05** 0.15	0.0037 2.70*** 0.22	0.0045 3.24*** 0.27	0.0040 2.57** 0.26	0.0039 2.55** 0.22	0.0042 2.90*** 0.24	0.0016 0.97 0.07	0.0027 2.09** 0.13
Sh4	0.08 2.36** 0.18	0.066 2.01** 0.15	0.12 3.26*** 0.28	0.09 2.46** 0.22	0.007 0.13 0.01	0.09 2.57** 0.20	0.08 2.37** 0.19	0.07 2.02** 0.18	0.016 0.38 0.04
AvSales	−5.34e−7 −0.93* −0.08	−6.31e−7 −2.32** −0.09	−5.79e−7 −2.84*** −0.09	−5.92e−7 −2.15** −0.08	4.41e−7 0.09 0.01	−5.12e−7 −1.84* −0.08	−5.64e−7 −2.05** −0.08	−5.67e−7 −2.08** −0.09	−4.87e−7 −2.08** −0.08
$ShImpl_1$	3.47 2.54** 0.16	3.79 2.90*** 0.19	3.63 2.59** 0.18	3.92 2.90*** 0.20	2.92 1.45 0.13	3.38 2.43*** 0.17	3.56 2.57** 0.17	4.09 2.90*** 0.22	1.51 1.04 0.05
ShEmp	0.31 1.16 0.08	0.49 1.81* 0.13	0.66 2.57** 0.17	0.29 1.07 0.08	−0.41 −1.19 −0.10	0.30 1.10 0.08	0.29 1.08 0.07	0.13 0.43 0.03	0.08 0.19 0.02
Loss	0.08 1.30 0.10	0.12 1.94* 0.15	0.09 1.49 0.12	0.09 1.53 0.13	0.02 0.32 0.03	0.04 0.50 0.04	0.06 1.09 0.09	0.05 0.82 0.07	0.08 0.97 0.09
DInt	−2.12 −1.53 −0.14	−1.73 −1.23 −0.11	−1.14 −0.83 −0.07	−1.68 −1.17 −0.11	−0.24 −0.13 −0.02	−2.63 −1.83* −0.17	−1.47 −1.05 −0.09	−2.60 −1.82* −0.18	−8.38 −4.76*** −0.42
R^2	0.570	0.597	0.573	0.611	0.577	0.585	0.58	0.491	0.699
F	17.78	33.16	22.26	13.76	13.22	17.20	17.65	11.18	55.30

Comment. Dependent variable — *Rate*. The variable EST($ShImp_{21}$) is predicted from the Import Penetration model.

Estimation using Huber/White/sandwich estimator of standard errors. Number of observations omitted is in parentheses.

In the table cells, the first figure stands for the regression coefficient, the second figure stands for the value of the *t*-statistic, the third figure stands for the value of the beta coefficient.

* — significant at the 10 per cent confidence level; ** — significant at the 5 per cent confidence level; *** — significant at the 1 per cent confidence level.

Table A6b. Sensitivity of the Endogenous Protection Model to the Exclusion of Observations for Different Industry Groups — the "Strong Test".

	Basic specification	Industry group excluded:							
		Fuel (6 obs.)	Ferrous metallurgy (11 obs.)	Chemistry (22 obs.)	Machine-building (24 obs.)	Wood & paper (8 obs.)	Construction materials (4 obs.)	Light industry (8 obs.)	Food industry (30 obs.)
Y-intercept	−3.56 −1.02	−4.81 −1.30	−5.95 −1.79*	−6.20 −1.62	−2.33 −0.63	0.78 0.22	−2.96 −0.86	0.04 0.01	6.92 1.37
EST ($ShImp_{21}$)	0.44 5.75*** 0.51	0.30 5.13*** 0.38	0.38 4.97*** 0.43	0.44 4.61*** 0.54	0.58 5.31*** 0.75	0.44 7.28*** 0.56	0.43 5.95*** 0.51	0.37 4.72*** 0.44	0.29 4.04*** 0.39
ΔOut	0.0038 0.25 0.02	0.01 0.61 0.04	0.0089 0.64 0.04	0.0095 0.69 0.04	0.0003 0.03 0.00	0.0041 0.32 0.02	0.0057 0.40 0.03	0.0033 0.21 0.84	−0.024 −1.21 −0.08
NEnt	0.0036 2.58** 0.20	0.0029 1.89* 0.17	0.0038 2.64*** 0.22	0.0044 3.21*** 0.26	0.0022 1.56 0.14	0.0037 2.63*** 0.21	0.0042 2.89*** 0.24	0.0013 0.80 0.06	0.0025 2.22** 0.12
Sh4	0.081 2.36** 0.19	0.074 1.82* 0.17	0.13 3.32*** 0.30	0.091 2.44** 0.22	0.025 0.55 0.05	0.094 2.86*** 0.21	0.084 2.37** 0.20	0.07 1.90* 0.18	0.034 0.77 0.08
AvSales	−5.34e−7 −1.93* −0.08	−6.67e−7 −2.86*** −0.10	−5.27e−7 −3.01*** −0.08	−4.96e−7 −1.80* −0.07	7.47e−7 0.15 0.01	−4.43e−7 −1.54 0.07	−5.76e−7 −2.12** −0.09	−5.96e−7 −2.39** −0.10	−6.55e−7 −3.84*** −0.10
$ShImpl_1$	3.47 2.54** 0.17	3.96 2.55** 0.19	3.62 2.52** 0.18	3.63 2.72*** 0.18	1.56 1.01 0.07	3.54 2.69*** 0.17	3.72 2.64*** 0.18	4.33 2.96*** 0.23	2.24 1.53 0.08
ShEmp	0.31 1.16 0.08	0.20 0.63 0.05	0.58 2.15** 0.15	0.26 0.98 0.07	−0.39 −1.34 −0.10	0.10 0.42 0.003	0.25 0.92 0.06	0.09 0.28 0.02	0.34 0.81 0.08
Loss	0.078 1.30 0.10	0.18 2.70*** 0.22	0.11 1.73* 0.15	0.11 1.76* 0.45	0.06 1.04 0.08	−0.02 −0.32 −0.02	0.057 0.93 0.07	0.07 1.00 0.09	0.16 1.84* 0.18
DInt	−2.13 −1.53 −0.14	−2.26 −1.38 −0.15	−1.52 −1.07 −0.10	−1.94 −1.35 −0.12	0.88 0.59 0.06	−2.60 −1.93* −0.17	−1.59 −1.13 −0.10	−3.03 −2.03** −0.21	−9.71 −5.37*** −0.49
R^2 F	0.570 17.78	0.47 16.93	0.534 21.26	0.61 13.70	0.668 16.60	0.624 23.14	0.566 17.59	0.452 10.57	0.668 15.70

Comment. Dependent variable — *Rate*. Estimation using Huber/White/sandwich estimator of standard errors. Number of observations omitted is in parentheses.

Values of the EST($ShImp_{21}$) variable used to test different variants of the Endogenous Protection model are predicted from the respective variants of the Import Penetration model (Table 5).

In the table cells, the first figure stands for the regression coefficient, the second figure stands for the value of the *t*-statistic, the third figure stands for the value of the beta coefficient.

* — significant at the 10 per cent confidence level; ** — significant at the 5 per cent confidence level; *** - significant at the 1 per cent confidence level.

Table A7. Sensitivity of the Endogenous Protection Model to the Exclusion of Independent Variables.

	Basic specification	Variable excluded:								
		EST($ShImp_{21}$)	ΔOut	NEnt	Sh4	AvSales	$ShImpl_1$	ShEmp	Loss	DInt
Y-intercept	−3.56 −1.02	3.00 0.82	−3.34 −0.98	−5.36 −1.46	0.60 0.16	−3.90 −0.12	−2.22 −0.65	−1.75 −0.55	−0.33 −0.13	−4.94 −1.41
EST ($ShImp_{21}$)	0.44 5.75*** 0.51		0.45 6.15*** 0.52	0.44 5.23*** 0.51	0.43 5.15*** 0.51	0.45 5.83*** 0.52	0.45 5.83*** 0.52	0.43 5.88*** 0.50	0.46 6.17*** 0.54	0.48 6.30*** 0.55
ΔOut	0.0038 0.25 0.02	0.04 3.09*** 0.18		0.008 0.52 0.04	−0.0014 −0.09 −0.01	0.002 0.14 0.01	0.0016 0.09 0.01	0.004 0.26 0.02	0.0001 0.01 0.0004	0.0004 0.03 0.002
NEnt	0.0036 2.58** 0.20	0.0034 2.04** 0.19	0.0037 2.61*** 0.20		0.0032 2.16** 0.18	0.0036 2.61*** 0.20	0.004 2.92*** 0.22	0.0037 2.58** 0.21	0.0044 3.61*** 0.25	0.0045 3.47*** 0.25
Sh4	0.081 2.36** 0.19	0.07 1.54 0.16	0.08 2.38** 0.18	0.07 2.14** 0.17		0.08 2.45** 0.19	0.09 2.60** 0.21	0.07 1.93* 0.16	0.07 2.15** 0.17	0.08 2.24** 0.18
AvSales	−5.34e−7 −1.93* −0.08	−6.66e−7 −4.21*** −0.10	−5.24e−7 −1.92* −0.08	−5.37e−7 −1.96* −0.08	−5.97e−7 −2.02** −0.09		−4.99e−7 −1.86* −0.07	−5.87e−7 −1.98** −0.08	−5.72e−7 −1.97** −0.08	−6.03e−7 −2.16** −0.09
$ShImpl_1$	3.47 2.54** 0.17	3.93 2.04** 0.19	3.45 2.55** 0.17	3.86 2.81*** 0.18	3.91 2.84*** 0.19	3.42 2.49** 0.16		3.47 2.54* 0.17	3.32 2.43** 0.16	4.14 3.30*** 0.20
ShEmp	0.31 1.16 0.08	−0.03 −0.08 −0.01	0.31 1.17 0.08	0.35 1.21 0.09	0.10 0.34 0.03	0.34 1.28 0.09	0.31 1.14 0.08		0.29 1.10 0.07	0.40 1.47 0.10
Loss	0.078 1.30 0.10	0.17 2.40** 0.22	0.08 1.25 0.10	0.14 2.63*** 0.19	0.05 0.78 0.06	0.08 1.37 0.11	0.07 1.08 0.09	0.07 1.20 0.10		0.06 1.02 0.07
DInt	−2.13 −1.53 −0.14	−4.76 −3.07*** −0.31	−2.09 −1.51 −0.13	−3.18 −2.48** −0.20	−1.99 −1.42 −0.13	−2.26 −1.64 −0.15	−2.92 −2.18** −1.19	−2.39 −1.72* −0.15	−1.79 −1.35 −0.11	
R^2	0.570	0.378	0.570	0.545	0.544	0.565	0.55	0.565	0.563	0.558
F	17.78	16.75	19.79	12.84	15.87	20.04	21.20	19.07	19.00	19.25

Comment. In the table cells, the first figure stands for the regression coefficient, the second figure stands for the value of the *t*-statistic, the third figure stands for the value of the beta coefficient.

* — significant at the 10 per cent confidence level; ** — significant at the 5 per cent confidence level; *** — significant at the 1 per cent confidence level.

REFERENCES

Afontsev, S. (2000) Political economy mechanisms of tariff protection in Russia, *EERC Working Papers Series* 99/16 (Moscow).

Bhagwati, J.N., A. Panagariya and T.N. Srinivasan (1998) *Lectures on international trade* (The MIT Press, Cambridge).

Buchanan, J.M. (1980) Rent seeking and profit seeking, in: J.M. Buchanan, R.D. Tollison and G. Tullock, eds., *Toward a theory of rent-seeking society* (Texas A&M University Press, College Station), 3 – 15.

Davis, D.R. (1997) Critical evidence on the comparative advantage? North-North trade in a multilateral world, *Journal of Political Economy*, October **105** (5), 1051 – 1060.

Caves, R.E. (1976) Economic models of political choice: Canada's tariff structure, *Canadian Journal of Economics* **9**, 278 – 300.

Corden, W.M. (1974) *Tariffs, subsidies, and terms of trade* (Basil Blackwell, New York, Oxford).

Favley, R. (1981) Commercial policy and intra-industry trade, *Journal of International Economics* **11**, 495 – 511.

Francois, J.F., B. McDonald and H. Nordstrom (1995) Assessing the Uruguay round, in: W. Martin and L.A. Winters, eds., *The Uruguay round and the developing countries*, World Bank Discussion Paper 307.

Fujita, M., P. Krugman and A. Venables (1999) *The spatial economy*. (The MIT Press, Cambridge).

Gawande, K. and U. Bandyopadhyay (2000) Is protection for sale? Evidence on the Grossman – Helpman theory of endogenous protection, *The Review of Economics and Statistics* **82** (1), February, 139–152.

Goldberg, P.K. and G. Maggi (1999) Protection for sale: An empirical investigation, *American Economic Review* **89** (5), December, 1135 – 1155.

Greenaway, D., R.C. Hine and C.R. Milner (1995) Vertical and horizontal intra-industry trade: A cross-industry analysis for the United Kingdom, *Economic Journal* **105** (433), 1505 – 1518.

Greenaway, D. and C.R. Milner (1986) *The economics of intra-industry trade* (Basile Blackwell, Oxford).

Greenaway, D. and J. Torstensson (1998) Economic geography, comparative advantage and trade within industries: Evidence from the OECD, *CEPR Discussion Paper* 1857, April.

Greenaway, D. and J. Torstensson (1997) Back to the future: Taking stock of intra-industry trade, *Weltwirtschaftliches Archiv* **133** (2), 249 – 269.

Grossman, G.M. and E. Helpman (1994) Protection for sale, *American Economic Review*, September **84** (4), 833 – 850.

Harrison, A. and G. Hanson (1999) Who gains from trade reform? Some remaining puzzles, *NBER Working Paper* 6915, January.

Harrison, G.W., T.F. Rutherford and D.G. Tarr (1997) Quantifying the Uruguay round, *Economic Journal*, September **107** (444), 1405 – 1430.

Helpman, E. (1999) The structure of foreign trade, *Journal of Economic Perspectives*, Spring, **13** (2), 121 – 144.

Hertel, T.W., W. Martin, K. Yanagishima and B. Dimaranan (1995) Liberalizing manufactures trade in a changing world economy, in: W. Martin and L.A. Winters, eds., *The Uruguay round and the developing countries*, World Bank Discussion Paper 307.

Hillman, A. and H. Ursprung (1996) The political economy of trade liberalization in the transition, *European Economic Review* **40** (3 – 5), 783 – 794.

Krugman, P. (1979) Increasing returns, monopolistic competition, and international trade, *Journal of International Economics* **9**, 469 – 479.

Krugman, P. (1980) Scale economies, product differentiation, and the pattern of trade, *American Economic Review* **70**, 950 – 959.

Krugman, P. (1995) Increasing returns, imperfect competition, and the positive theory, in: G. Grossman and K. Rogoff, eds., *Handbook of International Economics*, Vol. 3 (North-Holland, Amsterdam) 1243 – 1277.

Magee, S.P., W.A. Brock and L. Young (1989) *Black hole tariffs and endogenous protection theory* (Cambridge University Press, Cambridge).

Mayer, W. (1984) Endogenous tariff formation, *American Economic Review* **74** (5), December, 970 – 985.

Neven, D.J., Z. Bessonova and M. Gorban (1998) Enterprise restructuring in the Russian manufacturing sector, 1992 – 1996: An overview. Paper presented at the RECEP Conference "Economic and Social Reform in Russia: A European – Russian Dialogue", Moscow, 11 – 12 September.

Neven, D.J. (1994) Trade liberalization with eastern nations. How sensitive? *CEPR Discussion Paper*, July, 1000.

Olarreaga, M. and I. Soloaga (1998) Endogenous tariff formation: The case of MERCOSUR, *The World Bank Economic Review* **12** (2), May, 297 – 320.

Rodrik, D. (1995) Political economy of trade policy. In: G. Grossman and K. Rogoff, eds., *Handbook of International Economics*, Vol. 3 (North-Holland, Amsterdam) 1457 – 1494.

Rodrik, D. (1989) Promises, promises: Credible policy reforms via signalling, *Economic Journal* **99** (397), September, 756 – 772.

Torstensson, J. (1998) Country size and comparative advantage: An empirical study, *Weltwirtschaftliches Archiv* **134** (4), 590 – 611.

Torstensson, J. (1991) Quality differentiation and factor proportions in international trade: An empirical test of the Swedish case, *Weltwirtschaftliches Archiv* **127** (1), 183 – 194.

Trefler, D. (1993) Trade liberalization and the theory of endogenous protection: An econometric study of US import policy, *Journal of Political Economy* **101** (1), February, 138 – 160.

Trefler, D. (1995) The case of the missing trade and other mysteries, *American Economic Review* **85** (5), December, 1029 – 1046.

Wunner, N. (1998) Trade liberalization and political support in transition economies, *Economics of Transition* **6** (2), 409 – 425.

EERC PUBLICATIONS — SUBSCRIPTION FORM

Please note that subscription for all EERC publications is free of charge.

INSTITUTIONAL SUBSCRIPTION

Institution: _____

Department: _____

Address: _____

Contact Person

Name: _____

Position: _____

Telephone: _____

E-mail: _____

INDIVIDUAL SUBSCRIPTION

Full Name: _____

Address: _____

Place of Work

Affiliation: _____

Department: _____

Position: _____

Address: _____

Telephone: _____

Fax: _____

E-mail: _____

INDIVIDUAL SUBSCRIPTION

We/I would like to subscribe to the following publications:

□ ***Newsletter*** "Research in Transition"

□ ***Annual Conference Report***

Working Papers

- □ Enterprises and Product Markets — EPM;
- □ Labor Markets and Social Policy — LM;
- □ Macro, Financial Markets and Open Economy Macro — MFM;
- □ Public Economics — PE.

Signature Date

Please return this form to the address below:

Economics Education and Research Consortium

- **18 Malaya Pirogovskaya, Suite 101,**
- **119435 Moscow, Russia.**
- **Tel./Fax : +7 (095) 232 3349; 248 2728**
- **Fax: +1 (202) 478 19 68**

EERC Working Paper Series

No	Authors, Title	Research Area
98/01	Alexis Belianin "Risk Attitudes and Choice under Uncertainty: Experimental Evidence from Russia"	EPM
98/02	Sergei Levendorskii and Svetlana Boyarchenko "1) Models of Investment under Uncertainty when Shocks are Non-Gaussian; 2) On the Impact of the Policy Uncertainty on Investment"	EPM
98/03	Vladimir Matveenko, Katherine Vostroknoutova and Maxim Bouev "Transformational Decline and Preconditions of Growth in Russia"	MFM
98/04	Lilia Ovcharova, Evgeny Turuntsev and Irina Korchagina "Indicators of Poverty in Transitional Russia"	LM
98/05	Solomon Movshovich, Galina Krupenina and Maria Bogdanova "The Marginal Excess Burden of Taxes in the Russian Transition"	MFM
98/06	Georgi Trofimov "Economic Development and Gains from Trade"	PE
99/01	Svetlana Avdasheva and Nadezhda Rozanova "Analysis of Structural Development of Petroleum and Sugar Markets in the Russian Economy"	EPM
99/02	Victor Esipov, Dale J. Menkhaus and Alla Yakunina "Experimental Study of Forward and Spot Markets: Contract Failure as a Contributing Factor of Vertical Integration"	EPM
99/03	Vadim Arkin, Elmira Shevtsova and Alexander Slastnikov "Tax Incentives for Investment Projects in the Russian Economy"	EPM
99/04	Darya Nesterova and Klara Sabirianova "Investment in Human Capital under Economic Transformation in Russia"	LM
99/05	Vitaly Barinov, Anatoly Pervozvansky and Tatyana Pervozvanskaya "State Debt Policy and State Bond Market Behavior"	MFM
99/06	Anatoly Peresetsky and Alexander Ivanter "The Development of the State Bond Market"	MFM
99/07	Oleg Eismont and Karlygash Kuralbaeva "Depletion of Natural Resources and Long-Term Growth of the Russian Economy"	MFM
99/08	Evsey Gurvich and Arkady Dvorkovich "Interest Rates and Domestic Borrowing Costs in the Medium-Term Perspective"	MFM

99/09	Nadezhda Mikheeva "Differentiation of Social and Economic Situation in Russian Regions and Problems of Regional Policy"	**PE**
99/10	Alexander Vasin and Elena Panova "Tax Collection and Corruption in Fiscal Bodies"	**EPM**
99/11	Tatyana Bogomolova and Vera Tapilina "Income Mobility in Russia in the mid-1990s"	**LM**
99/12	Irina Denisova "Monetary Policy Transmission: the Role of Industrial Interenterprise Arrears"	**MFM**
99/13	Oksana Dynnikova "Real Appreciation and Output: Russia 1993-1997"	**MFM**
99/14	Petr Zemskov and Sergey Zemskov "Nizhny Novgorod: Computable General Equilibrium in One Region with Barter and Arrears"	**PE**
99/15	Ekaterina Zhuravskaya "Incentives to Provide Local Public Goods: Fiscal Federalism, Russian Style"	**PE**
99/16	Sergey Afontsev "Political Economy Mechanisms of Tariff Protection in Russia: an Empirical Study"	**PE**
99/17	Konstantin Glushchenko "Inter-regional Variability of Inflation Rates"	**PE**
2K/01	Yuri Perevalov, Ilya Gimadi and Vladimir Dobrodey "Analysis of the Impact of Privatisation on the Performance of Medium- and Large-size Industrial Enterprises in Russia"	**EPM**
2K/02	Constantin Sonin "Inequality, Property Rights and Economic Growth in Transition Economies: Theory and Russian Evidence"	**PE**
2K/03	Evgeny Dorofeev "Volatility of Economic Factors and Capital Market Dynamics in Russia"	**MFM**
2K/04	Alexei Savvateev "The Role of Externalities in Determining he Average Level of Corruption in Production Process"	**PE**
2K/05	Alexander Khutoretsky " Analysis of Short-Term Equilibria in a Housing Market with Application to Development of Housing Policy "	**EPM**
2K/06	Alexander Tsyplakov "Does Lower Inflation Imply Lower Uncertainty?"	**MFM**
2K/07	Evgenia Kolomak "Sub-Federal Tax Exemptions in Russia: Less Taxes, More Investment?"	**PE**
2K/08	Sergei Levendorskii and Svetlana Boyarchenko "Money Substitutes in the Russian Virtual Economy: Sources and Impact on the Economy"	**MFM**
2K/09	Alexey Shevyakov and Alexander Kiruta "Economic Inequality and Poverty in Russia: Measurement Methods and Analysis of Causal Dependencies"	**LM**

2K/10	Alexis Belianin and Olga Issoupova "Financial Pyramids in Transitional Economies: a Game-Theoretic Approach"	**MFM**
2K/11	Klara Sabirianova "The Great Human Capital Reallocation: A Study of Occupational Mobility in Transitional Russia"	**LM**
2K/12	Alexey Medvedev and Georgy Kolodyazhny "Financial Crisis in Russia: The Behavior of Non-Residents"	**MFM**
01/01	Sergey Aivazian and Stanislav Kolenikov "Poverty and Expenditure Differentiation of the Russian Population"	**LM**
01/02	Artem Kuznetsov and Oleg Ordin "Pension Reform in Russia: A General Equilibrium Approach"	**PE**
01/03	Natalya Volchkova "Does Financial-Industrial Group Membership Affect Fixed Investment? Evidence from Russia"	**EPM**
01/04	Ruvim Shakhnovich, Galina Yudashkina "Wage-Setting and Employment Behavior of Enterprises during the Period of Economic Transition"	**LM**
01/05	Alla Friedman and Alexey Verbetsky "Currency Substitution in Russia"	**MFM**
01/07	Sergey Afontsev "Endogenous Tariff Protection and the Level of Trade Distortions in Russia"	**PE**
01/08	Lyudmila Nivorozhkina, Evgenii Nivorozhkin, Andrei Shuhmin "Modeling Labor Market Behavior of the Population of a Large Industrial City: Duration of Registered Unemployment"	**LM**
01/09	Alexander Vasin, Polina Vasina "Tax Optimization under Tax Evasion: The Role of Penalty Constraints"	**PE**
01/10	Pavel Kuznetsov, Alexander Muravyev "Ownership Structure and Firm Performance in Russia: The Case of Blue Chips of the Stock Market"	**EPM**
01/11	Konstantin Gluschenko "To What Extent is the Russian Economic Space Single?"	**EPM**
01/12	Andrei Timofeev "Fiscal Decentralization and Soft Budget Constraints"	**PE**
01/14	Alla Yakunina, Dale Menkhaus "Price Discovery and Market Information in the Transition Economy of Russia: A Laboratory Study"	**EPM**

Research Areas

EPM — Enterprises and Product Markets; **LM** — Labor Markets and Social Policy;

MFM — Macro, Financial Markets and Open Economy Macro; **PE** — Public Economics